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Entomology 2017

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Sharing Insect Science Globally

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Presidential Welcome Message for Entomology 2017

Dr. Susan Weller

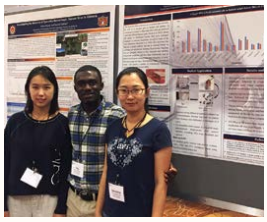
Welcome to Entomology 2017! I am so pleased that you decided to join us in Denver. The ESA planning committee, staff and I are committed to creating an inclusive and welcoming meeting environment for our members and meeting attendees. We have worked hard to open up novel opportunities for different kinds of networking, presentations and discussion venues. Our program planning committee has wholeheartedly taken on the task of living up to our meeting theme: *ignite. inspire. innovate.*

I had a busy year working for you. Among the highlights for me was visiting our branch meetings and having the opportunity to meet many of you. Each branch has its own set of traditions — some escort the new Branch President to the stage when it is time to pass the gavel (SEB, NCB), others host community (EB) and K12 insect expositions (SWB), or embrace social media with texting competitions (PBESA).

You all share the passion of having stellar scientific programs that address global problems in your local region. I heard excellent student presentations, topical and cutting-edge symposia with thought-provoking speakers, and the latest news from industry and governmental agencies. It was intellectually an incredibly stimulating spring for me!

The science of Entomology is global; therefore, ESA is global

At those branch meetings, I also spent time listening and learning what makes you want to be a member of ESA. I am glad that many of you were proud that ESA stepped forward to be counted among the first sponsors of the March for Science. I commend ESA leadership for supporting this action and commend ESA staff for flawless execution of support in DC and satellite marches. I salute and thank all of you who marched and who spoke at their Marches representing our science of Entomology. I cherish my March for Science sign created using the ESA provided kit — the sign sits right next to the Presidential gavel in my home office.



To realize our profession's full potential ESA must increase its influence

At branch meetings, I heard from you the need for ESA to be a more visible advocate of science policy and scientific issues important to our members. You also agreed that ESA should, at annual and branch meetings, help members become better science communicators themselves through workshops and other opportunities. You also shared that you wanted a Society that was more inclusive and showed that it valued you and your contributions.

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ESA has a social responsibility to develop ALL its members

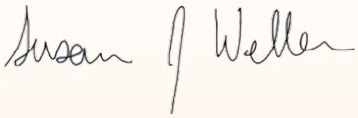
So there you have it — **social, global, and influence** — the three key words that are tied to our core strategic principles.

So much of ESA's success now was enabled by the Renewal, a restructuring of the Society that occurred ten years ago. The Renewal established our current Sections and provided more autonomy for them and Branches to lead their own programs and initiatives. But, we cannot rest on these laurels. To enable the next ten years of success for the Society and our members, we need to continue to evolve to meet members' needs and exceed your expectations.

You've expressed your expectations through surveys and participation in taskforces or workshops. I thank all of you who have contributed. You will hear more in the coming year about proposed structural governance changes and we welcome everyone's comments and insights. ESA leadership envisions a more nimble society that is responsive to members as we continue to work on strategic principles.

We'll begin this journey of change under the leadership of our next President, Michael Parrella. I have worked with the Governing Board, Section and Branch leadership and Past Presidents, to lay the foundation for this second renewal. As Past President in 2018, I look forward to working with Michael, ESA leadership and members to design and implement changes that will support ESA's future and continued success as the Society who promotes *opportunities for entomologists and enables them to share their science globally* (ESA mission statement).

Again, welcome to Denver! Thank you for attending ENTOMOLOGY 2017.



Dr. Susan Weller, Director
University of Nebraska State Museum
President, Entomological Society of America

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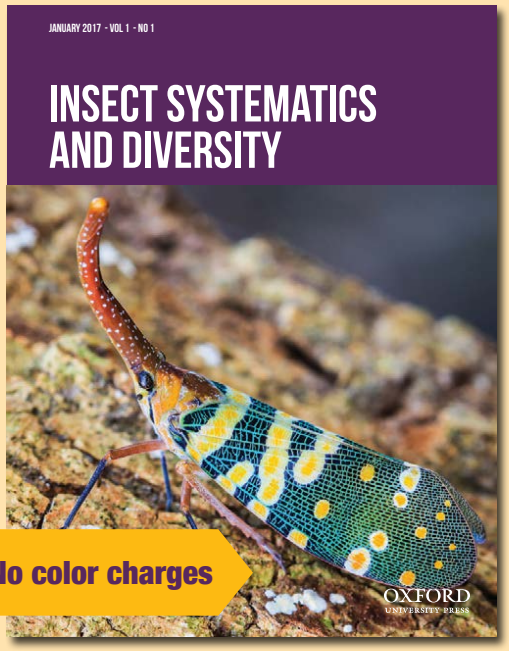

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ESA'S NEWEST JOURNAL
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Insect Systematics and Diversity (ISD) publishes original research on systematics, evolution, and biodiversity of insects and related arthropods—with **no page charges** for ESA members.

The journal welcomes integrative studies incorporating comparative and functional morphology, conservation, behavior, taxonomy, molecular phylogenetics, paleobiology, natural history, and articles that utilize novel technologies or data types or describe emerging methods of research. Dr. Sydney A. Cameron and Dr. James B. Whitfield serve as co-editors-in-chief.

Visit *academic.oup.com/isd* to learn more.

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ENTOMOLOGICAL SOCIETY OF AMERICA

Program Committee Co-Chairs' Welcome

Welcome to the Mile High City—Denver, Colorado, and the 65th Annual Meeting of the Entomological Society of America! The Program Committee has been working hard to shape the meeting championed by President Susan Weller's theme of *ignite. inspire. innovate.* Along with our typical symposia, contributed papers, and posters, we are continuing the interactive Lunch and Learns and are highlighting an exciting lineup of Workshop offerings. Additionally, we will explore new ways to collaborate and communicate, including inspirational Sunrise Sessions and fast-paced Three-Minute Lightning Bug talks for students and members.

The Program Committee accepted four Program Symposia, four Workshops, eight Lunch and Learns, and five Sunrise Sessions for 2017:

Program Symposium: Grand Challenges: Tackling Invasive Species and Communication Strategies

- Organizers: Mustapha Debboun, Alec Gerry, Peter Jensen, Blair Siegfried, Melissa Willrich Siebert, Mark Wright, Patrick Moran, Faith Oi, Chris Stelzig, Christopher Beatty, and Andrew Short

Program Symposium: Igniting the Spark: Science Communication by the Next Generation of Entomologists

- Organizers: Rob Morrison, Kyndall Dye, Isobel Ronai, Amy C. Morey, Erika Machtinger, William R. Kuhn, and Ana Vélez

Program Symposium: The Power of Cooperation: Collaborations that Facilitate Advancements in Science

- Organizers: Carlos Esquivel, Adekunle Adesanya, Jocelyn R. Holt, Alix Whitener, and Andrea Skiles

Program Symposium: Igniting Cross Disciplinarity, Inspiring Novel Research, and Innovating Solutions to the World's Biggest Killers: Ecological and Evolutionary Perspectives of Biodiversity in the Mosquitoes

- Organizers: Michael Reiskind and Brian Wiegmann

Workshop: Ignite, Inspire, and Innovate through Education and Outreach

- Organizers: David Held, John Guyton, Ronda Hamm, and Michelle Smith

Workshop: Insect Genome Editing: Why and How

- Organizers: Marcé Lorenzen, Jennifer A. Brisson, and David O'Brochta

Workshop: Promulgate Your Passion: Techniques to Create, Engage, and Communicate Science

- Organizers: Aaron Pomerantz, Phil Torres, and Chris A. Johns

Workshop: Making the Switch: A Beginner's Guide to R for Those Familiar with Other Packages

- Organizer: Rebecca Schmidt-Jeffris

Lunch and Learn: How to Talk to a Nine-Year-Old about Climate Change (and Other Tough Concepts!) Using Informal Invertebrate Education

- Organizer: Mario Padilla

Lunch and Learn: To the Head of the Class: Preparing for Your First Faculty Teaching Position

- Organizers: Laura Weiser Erlandson and Elizabeth Butin

Lunch and Learn: Inspiring Science through Storytelling

- Organizer: Rayda Krell

Lunch and Learn: Science Policy 101 for the Entomologist

- Organizers: Ashley Kennedy, Thomas Anderson, Katelyn Kesheimer, Ana Vélez, and Lina Bernaola

Lunch and Learn: *This Week in Science* Podcast Live Taping!

- Organizer: Johanna E. Elsensohn and Rob R. Dunn

Lunch and Learn: 1, 2...Eyes on You: Classroom Management, Crowd Control, and How to Rock Any Outreach Presentation

- Organizer: Kristie Reddick

Lunch and Learn: Creative Writing for Entomologists: Short Forms and Little Creatures

- Organizer: Jeffrey Lockwood

Lunch and Learn: ESA Publications "Ask Me Anything"

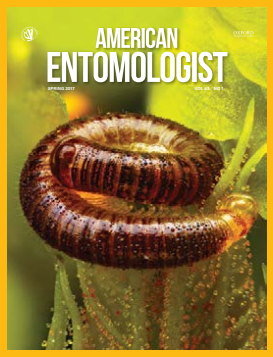
- Organizer: Lauren Godwin

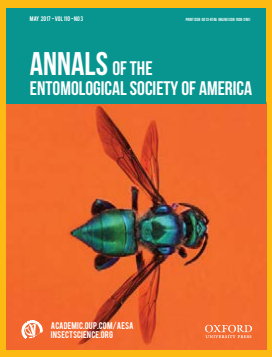
Sunrise Session: "Bugs on Bugs": An Inquiry-Based, Collaborative Activity to Illustrate the Diversity of Arthropods and their Symbionts

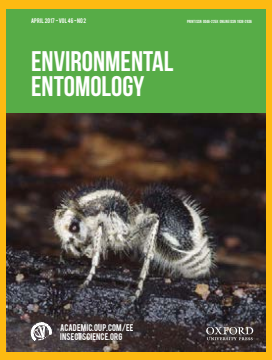
- Organizers: Evan Lampert, Jeanelle M. Morgan, and Swapna Bhat

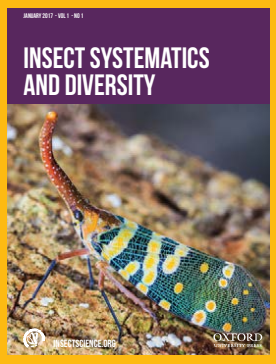
Sunrise Session: Achieving Success as a Mentor through Implementation of Effective Mentoring Strategies

- Organizers: Ana Vélez, Lina Bernaola, and Katelyn Kesheimer









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Sunrise Session: Women in Entomology Breakfast

- Organizers: Gail E. Kampmeier, Elizabeth F. Beckemeyer, Rayda K. Krell, Patricia Prasifka, Amanda Jacobson, and Michelle Smith

Sunrise Session: Igniting School Staff and Student Interest in IPM through Innovation

- Organizers: Janet Hurley, Thomas Green, Susan T. Ratcliffe, Matthew Baur, and Rebecca Baldwin

Sunrise Session: USDA-APHIS-BRS and EPA Training on Permitting for Genetically Engineered Insects

- Organizers: Abigail Walter, Lisa Knolhoff, and Jeannette Martinez

The Program Committee followed the format set by the ICE 2016 meeting by having symposia talks last 15 minutes. Forty-four Section Symposia consisting of 488 talks were selected by the Section leadership, while an additional 43 Member Symposia consisting of 430 talks were accepted by the program co-chairs. Contributed oral presentations will be a robust component of this year's meeting, with 47 sessions composed of 593 ten-minute talks. A first for this year, the Three-Minute Lightning Bug talks have both student and non-student participants (33 talks). The poster co-chairs, Jesus Esquivel, Catherine Loudon, and Alvin Simmons, have arranged 21 Poster Sessions composed of 389 posters. Rounding out the Denver meeting, we have 21 Organized Meetings scheduled; these scientific meetings, which debuted in 2014, fall outside of other defined categories, and have proven to be popular among ESA annual meeting attendees for the past several years.

The Student Competition co-chairs, Surendra Dara and Cheryle O'Donnell, have put together a great Student Competition set for Sunday and Monday mornings. **Please note that the expansion of Student Competition talks that now fill two meeting mornings is a change from previous years in order to accommodate our robust meeting schedule.** They have arranged 48 sessions of 459 oral presentations, 27 sessions of 223 student posters, and two sessions of 39 Three-Minute Lightning Bug talks.

Another change this year includes efforts to *go green* by forgoing the distribution of tote bags at registration. Instead, we are encouraging attendees to **BYOT: Bring Your Own Tote**. Show your school spirit, represent your company, or choose your favorite bag from a past ESA or other conference! Look for an upcoming social media campaign including more info for #BringYourOwnTote.

We encourage you to share your excitement about the upcoming conference on social media using the official meeting hashtag #EntSoc17. Don't forget to download the mobile app prior to attending.

Enjoy our host city! Denver boasts 300 days a year of sunshine, an exciting cultural scene, and, of course, its natural beauty; what's not to love here? If you're an outdoor lover, you should make time during the meeting to escape to the nearby Rocky Mountain range, featuring pristine rivers and easily accessible day hikes. Check out the Mile High: Things to do (denver.org/things-to-do) site for more information on the surrounding area. Or, if you prefer, check out our meeting tour (p. 19) offerings, which offer a diverse selection of both indoor and outdoor adventures to choose from. Either way, we encourage you to make time to explore Colorado and downtown Denver during the Annual Meeting.

Wendy A. Johnson, **Robert L. Meagher Jr.**, and **Julie A. Peterson**
2017 ESA Program Committee Co-Chairs

Program Planning Committee

Pictured from left to right (top row): Julie Peterson, Catherine Loudon, Peter Jensen, Chris Beatty, Jesus Esquivel, Cheryle O'Donnell, Mustapha Debboun, Andrew Short, Alix Whitener, Rebecca Schmidt-Jeffris, Susan Weller, Surendra Dara, Alec Gerry, Alvin Simmons, Wendy Johnson

(Bottom row): Changlu Wang, Melissa Siebert, Rob Meagher

CROSSING BORDERS: ENTOMOLOGY IN A CHANGING WORLD

November 11–14, 2018 • Vancouver Convention Centre • Vancouver, British Columbia, Canada

Plan to participate in this collaborative meeting to celebrate the science next year in breathtaking Vancouver!

Crossing Borders...

from the entomological, geographic, and interdisciplinary perspectives

Vancouver, our host city

As a bustling seaport and Canada's greenest city, Vancouver offers a plethora of culinary delights, museums and markets, along with a colorful past. You can easily walk, bike or ride around the city; be sure to stop at Stanley Park for a breathtaking view of the harbor and its constant activities.

Entomology 2018 takes place in the Vancouver Convention Centre, one of the greenest structures in Canada, offering a 6-acre living grass roof and a seawater heating and cooling system. It even boasts its own European honeybee hives, that help pollinate the plants on the living roof while supplying honey for its 'scratch' kitchen.

Watch eNews and visit **entsoc.org/entomology2018** for details.

IMPORTANT DATES/DEADLINES:	
Symposia submissions	NOW OPEN
Program symposia deadline	1 FEBRUARY 2018
Section & member symposia, organized meetings, and workshops deadlines	1 MARCH 2018
Paper/poster submission, and lunch & learns deadlines	4 JUNE 2018

DIVERSITY & INCLUSION

Diversity and Inclusion Committee Welcome

The Diversity and Inclusion (D&I) Committee would like to welcome everyone to the 2017 Annual Meeting of the Entomological Society of America! Every year as we come together, all attendees, as well as the membership of our Society as a whole, embody a wonderfully diverse group of people. As we write this note, meeting registrants come from over 30 countries and 400 institutions, bringing many layers of diversity. With such diversity, the Society recognizes that the needs and interests of ESA members are also diverse. This is articulated in both the ESA Strategic Principle, "ESA has a social responsibility to develop all of its members," and the ESA Outcome Statement "To increase the diversity and satisfaction of members and customers as well as the value provided to them." As a result, the ESA Governing Board established the D&I Committee in 2015.

The D&I Committee seeks to increase the cultural competency of ESA members and proposes resources, programs, and services that will maximize support for diversity and inclusion of all members in ESA. One of the first tasks of the Committee was to formalize ESA's Diversity and Inclusion Statement. Using cultural and demographic data collected by ESA headquarters and surveys of ESA members, the Committee has further developed four initial goals:

1. Increase the overall diversity of speakers at ESA Annual and Branch meetings,
2. Increase overall diversity of ESA volunteers and members in leadership roles,
3. Increase the completion rate of ESA membership profile details, and
4. Increase the Society's awareness of the work the Committee is doing.

Last year we organized a D&I symposium, "Connecting with the World's Best Talent: Attracting and Retaining Diverse Entomologists," where speakers addressed D&I in ESA, the workplace, and across the sciences broadly. During this year's meeting in Denver, we would like to invite everyone to the Diversity and Inclusion reception on Monday, 6 November from 5:30 to 6:30 PM in the Capital Ballroom 1, Hyatt Regency. This reception will be a place to continue the conversation and momentum around D&I in ESA as well as to encourage more members, presenters, and attendees to learn about the D&I goals and to get involved.

You can also learn more about the D&I Committee, share your thoughts or concerns, or find out how to get involved by visiting our table in the ESA booth in the exhibit hall. Members of the D&I committee will be available to talk one-on-one. We would love to meet you and hear about how ESA can meet your needs and interests!

Sincerely,

The members of the Diversity and Inclusion Committee:

Juliana Rangel, Chair, Southwestern Branch Representative
Anne L. Nielsen, Eastern Branch Representative
Juliana Ugwu, International Branch Representative
Susan E. Moser, North Central Branch Representative
Nicholas C. Manoukis, Pacific Branch Representative
Gloria McCutcheon, Southeastern Branch Representative
Faith M. Oi, Medical, Urban & Veterinary Entomology Section Representative
Kun Yan Zhu, Physiology, Biochemistry and Toxicology Section Representative
Bill Hendrix, Plant-Insect Ecosystems Section Representative
Jessica L. Ware, Systematics, Evolution & Biodiversity Section Representative
Theresa Cira, Member-at-Large
William R. Morrison III, Member-at-Large
Ashley C. Kennedy, Student Liaison
Debi Sutton, ESA HQ Committee Liaison and ESA Director of Membership and Marketing
Katherine Matthews, ESA Database Manager

View the entire D&I statement on page 12.

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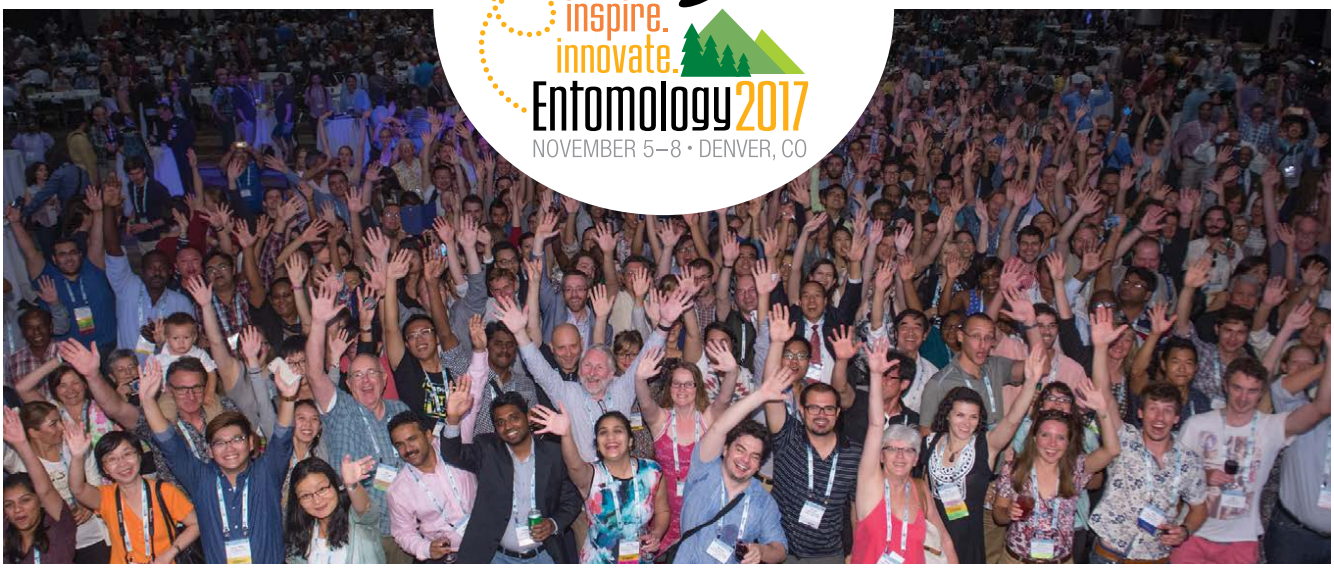


Come celebrate the diversity of ESA's membership and science

Stop by a reception sponsored by ESA's D&I Committee

MONDAY, NOVEMBER 6 • 5:30-6:30 PM
HYATT REGENCY DENVER HOTEL, CAPITOL BALLROOM 1

If you miss the reception, and want to learn about ESA's initiatives to support diversity and inclusion, stop by ESA's booth.

DIVERSITY & INCLUSION

entsoc.org/diversity

ESA's Statement on Diversity & Inclusion

The Entomological Society of America (ESA) is a professional organization dedicated to furthering the science and awareness of entomology through the advancement and professional development of all its members. ESA acknowledges and values all dimensions of diversity. Therefore, we welcome into our Society and encourage the participation of all individuals who are interested in entomology regardless of age, gender, gender identity, race, cultural background, religion, physical ability, sexual orientation, professional status, geographic location, and all other characteristics that make our members unique.

ESA actively promotes inclusion, recruitment, and retention in every aspect of the Society— including but not limited to membership, leadership, committees, and staff. We strive to cultivate a scientific society of excellence built on mentorship, encouragement, tolerance, and mutual respect. ESA is committed to proactively rejecting and denouncing prejudice and stereotyping whenever it is encountered in the Society or the profession.

About **Denver**

Denver, Colorado ...

host for ENTOMOLOGY 2017, is a city that offers something for everyone, especially the outdoor enthusiast! A young, active city at the base of the Colorado Rocky Mountains, Denver's stunning architecture, award-winning dining, and unparalleled views are all here, year-round. Nicknamed the Mile High City, it is exactly one mile (5,280 feet) above sea level, making it the highest major city in the United States.

Denver has long been a gathering place for people of all cultures. First were the high plains Native Americans who followed the buffalo herds and lived throughout the Front Range. When prospectors discovered gold in 1858, thousands of men (and a few women) crossed the Great Plains and settled in and around Denver. More than a third of the cowboys riding the cattle drives of this era were African-Americans, many of them freed slaves who migrated West after the Civil War. By the 1980s, Denver had been dubbed the gay oasis of the west. Gay men and women in the previous decade had organized and established themselves as a smart, cultured and politically active community.

For more information, visit: denver.org/about-denver/lgbt

– Information courtesy of Visit Denver

High Altitude Tips

- **DRINK WATER** – The low humidity in Colorado keeps the air dry, like the desert, so you need about twice as much water here as you would drink at home.
- **MONITOR YOUR ALCOHOL INTAKE** – Alcoholic drinks pack more of a wallop than at sea level.
- **EAT FOODS HIGH IN POTASSIUM** – Foods such as broccoli, bananas, avocado, cantaloupe, celery, greens, bran, chocolate, granola, dates, dried fruit, potatoes, and tomatoes will help you replenish electrolytes by balancing salt intake.
- **WATCH YOUR PHYSICAL ACTIVITY** – The effects of exercise are more intense here. If you normally run 10 miles a day at home, you might try six miles in Denver.
- **PACK FOR SUN** – With less water vapor in the air at this altitude, the sky really is bluer in Colorado. But there's 25 percent less protection from the sun, so sunscreen is a must. Denver receives over 300 days of sunshine each year. Bring sunglasses, sunscreen, and lip balm... even in the fall.
- **DRESS IN LAYERS** – Because the sun is especially powerful in Denver, it can feel much warmer than the actual temperature during the daytime, but then become very chilly after sundown, particularly in the spring and fall. It is best to layer your clothing.

Workshops

New this year, the Program Committee has added four Workshops to the conference schedule. Workshops are focused on science communication and professional developments and will engage participants in an interactive educational experience. Advance registration is required for some of the Workshops.

Ignite, Inspire, and Innovate through Education and Outreach

Sunday, November 5 • 1:30 – 5:30 PM

Meeting Room 705/707, Convention Center

This workshop is sold out.

The Education and Outreach Committee and Dow AgroSciences Science Ambassadors will lead hands-on activities highlighting STEM themes using insects or insect systems. These activities will be taught in small groups. This workshop will be useful for participants already involved with outreach and those with no prior experience with K-12 programs. For a deeper-dive into working with K-12 educators, consider attending the STEMbugs educator workshop on Saturday, November 4 (separate registration required).

Insect Genome Editing: Why and How

Tuesday, November 7, 1:30 – 5:30 PM

Meeting Room 704/706, Convention Center
Fee: No advance registration required. Open to all attendees.

Insect genome editing experts will present diverse examples of the application with technical details involved in executing their genome-editing projects. A tutorial on the design, analysis and synthesis of guide RNAs using web-based tools will be presented. Web-enabled devices are useful but not necessary for the tutorial.

Promulgate Your Passion: Techniques to Create, Engage, and Communicate Science

Wednesday, November 8, 8:00 AM – 12:00 PM

Meeting Room 703, Convention Center
Fee: No advance registration required. Open to all attendees.

Introductory multimedia workshop (photography, video and graphic media basics). Oration/presentation techniques (exercises such as crafting elevator pitches for general audiences). Deep dive into digital/visual creative communication (includes hands-on activities that illustrate design fundamentals, the importance of branding, audience identification, and general workflows/processes for creative content production).

Making the Switch: A Beginner's Guide to R for Those Familiar with Other Packages

Wednesday, November 8, 1:30 – 5:30 PM

Meeting Room 705, Convention Center

This workshop is sold out.

Join us for an introduction to key components of R. This interactive workshop will cover importing data, data manipulation, making figures, fitting a model, and making predictions. The workshop is designed for audiences who are new to R, but have some statistics background. Bring your laptop for this hands-on learning!

Ground Transportation

There are several options that will take you from the airport to downtown. Here are the most efficient options to maximize your time in Denver:

Regional Transportation District (RTD): Denver International Airport (DEN) now has a direct rail connection from downtown to the airport. When you exit the aircraft, follow signs for baggage claim or the transit center.

To get to the Denver Airport Station, follow signs to the "Transit Center" and proceed to the south end of the main terminal on Level 5 (located under the large American flag). Exit the terminal through the sliding glass doors and take the escalator located in the center of the plaza down to Level 1. You will board the A train to Union Station. From there, take the free 16th Street Mall Ride Shuttle to your hotel.

Tickets for the A Line may be purchased at the ticket vending machines located on the train platform using cash or credit cards; fares are $9 per person.

SuperShuttle and ExecuCar: You can book your reservation online with SuperShuttle using the ESA Discount Code "7ELSA" and save 10% on your booking: $22.50 one-way, $48 roundtrip to the downtown hotels (an additional $2.50 booking fee applies). Advance reservations are recommended via supershuttle.com.

After collecting luggage, customers must proceed to the SuperShuttle ticket counter to speak with a uniformed customer service representative (CSR). The ticket counter is located between the women's restroom and the ground transportation booth on the southwest side of the terminal. The ticket counter is staffed from 7:00 AM to 9:30 PM daily. A CSR will direct customers to the appropriate shuttle loading area on the transportation island. After hours, customers may use the courtesy phone located at the ticket counter to connect directly to dispatch for further assistance.

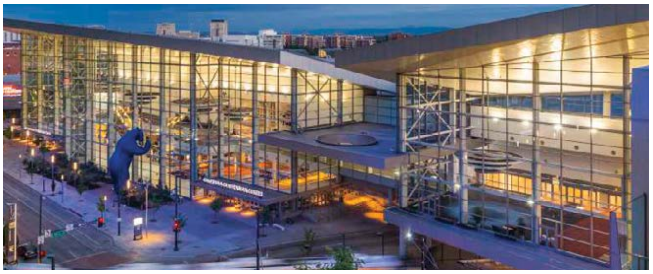
Ride Share: Lyft and Uber operate in the downtown Denver and airport areas. Download one of the apps on your smartphone to request a ride.

Taxis: Follow signs for ground transportation. Downtown Denver is approximately 25 miles from the airport, with a flat-rate charge of $55.57 (one-way).

For additional taxi service while in Denver, contact:

All Cities Taxi: 720-440-7000
Denver Yellow Cab: 303-777-7777
Mile High Cab: 303-337-2222

FREE 16th Street Shuttle/MallRide: This free hybrid vehicle scoots up and down the 16-block tree-lined retail core of downtown Denver.



Convention Center

The Colorado Convention Center (CCC) is the primary host facility of ENTOMOLOGY 2017. This LEED Gold Certified building will be home to our registration, Exhibit Hall, plenary sessions, award ceremonies, Student Competition, and all symposia, paper, and poster presentations. Located just two blocks from the closest stop of the free 16th Street Shuttle/MallRide, attendees can easily connect to all downtown areas just a few short steps out the front door and past the Blue Bear.

Colorado Convention Center
700 14th Street
Denver, CO 80202

Headquarters Hotels

Two hotel facilities will host official ENTOMOLOGY 2017 events throughout the week:

Hyatt Regency Denver
650 15th Street
Denver, CO 80202

Hampton Inn & Suites
550 15th Street
Denver, CO 80202

– Information and Colorado Convention Center photo courtesy of Visit Denver.

General Information

Registration and Information Center

Registration will be held in Concourse E of the Colorado Convention Center (CCC), above the foyer of the Mile High Ballroom, during the following times:

Saturday, November 4 • 3:00 – 6:00 PM
Sunday, November 5 • 7:00 AM – 9:00 PM
Monday, November 6 • 7:00 AM – 5:00 PM
Tuesday, November 7 • 7:00 AM – 5:00 PM
Wednesday, November 8 • 7:00 AM – 12:00 PM

Registration and Information Center phone number: 303-228-8325

Attendees can pick up their registration materials at the Registration Center. ESA staff are always available to answer your questions.

Business Center

The on-site UPS Business Center offers a variety of services from the main floor of the Convention Center, offering all of the amenities of a UPS store. Your shipping, copy, binding, printing, and signage needs can be handled on site prior to or during ENTOMOLOGY 2017. From last-minute supplies to overnight shipping, the Business Center is available to serve your business demands.

The UPS Business Center is set up to print your posters in advance and have them available for on-site pickup within the convention center. PDFs of your poster presentation may be submitted via e-mail at store6611@theupsstore.com. Payment may be made during on-site pickup. For more information, please visit: theupsstorelocal.com/6611; phone: 720-904-2300.

Certificates of Presentation and Attendance

Presenters can download and print on-site certificates of presentation and attendance in the Presentation Preview Room (PPR) in Meeting Room 210/212 of the Convention Center after their presentation has taken place. For hours of operation of the Presentation Preview Room, please see page 23. Attendees who did not present during ENTOMOLOGY 2017 may request certificates of attendance at the ESA Registration and Information Center. Certificates will also be available for download via Speaker's Corner after the conference ends; a personalized link will be provided after the Annual Meeting.

Code of Conduct

ESA is committed to promoting inclusion in every aspect of the Society; all are encouraged to participate in the Annual Meeting. Learn more about ESA's Diversity & Inclusion Initiative – www.entsoc.org/diversity

By attending any ESA event, you agree voluntarily to abide by our ethics policy.

Authorship: All authors connected to a presentation and/or abstract must agree on all information contained in the presentation. Failure of an author to agree to the presentation format will lead to the presentation being withdrawn from the conference.

An author who submits a presentation to the Annual Meeting must have intentions of attending, registering, and presenting at the meeting once the submission is accepted into the program. Repeated or consecutive last-minute cancellations by presenters may result in future submissions being denied.

Harassment and Safety: ESA is dedicated to providing a safe, hospitable, and productive environment for everyone attending our events, regardless of ethnicity, religion, disability, physical appearance, gender, or sexual orientation. It is important to remember that a community where people feel uncomfortable or threatened is neither healthy nor productive. Accordingly, ESA prohibits intimidating, threatening, or harassing conduct during our conferences. This policy applies to speakers, staff, volunteers, and attendees. Conference participants violating these rules may be sanctioned or expelled from the conference, at the discretion of ESA leadership.

Harassment of ESA participants will not be tolerated in any form. Harassment includes offensive gestures or verbal comments related to ethnicity, religion, disability, physical appearance, gender, or sexual orientation in public spaces, deliberate intimidation, stalking, following, harassing photography or recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome attention. Participants asked to stop any harassing behavior are expected to comply immediately.

If a participant or exhibitor engages in harassing behavior, ESA leadership may take any action they deem appropriate, ranging from a simple warning to the offender to expulsion from this and future conferences. If you are being harassed, notice that someone else is being harassed, or have any other concerns, please do not hesitate to contact ESA staff who can work with appropriate ESA leadership to resolve the situation.

ESA staff will be happy to help participants contact convention center/hotel/venue security or local law enforcement, and otherwise assist those experiencing harassment, to enable them to feel safe for the duration of the conference. We value your attendance, and want to make your experience as productive and professionally stimulating as possible.

Need to file a complaint? Please contact Rosina Romano, rromano@entsoc.org, 703-593-0222.

Photography: ESA requests that attendees not take photographs or videos during sessions because they are disruptive to the presenters. If you wish to take photographs of a presentation or poster, please contact the presenter for permission. ESA reserves the right to use photographs and videos taken and testimonials given during any ESA event for informational and promotional purposes.

Expected Behavior:

- Communicate openly with respect and consideration for others, valuing a diversity of views and opinions.
- Avoid personal attacks directed toward other attendees, participants, volunteers, exhibitors, ESA Staff and suppliers/vendors.
- Be mindful of our surroundings and your fellow participants. Alert ESA staff if you notice a dangerous situation or someone in distress.
- Respect the rules and policies of the convention center, hotels, ESA contracted facility, or any other venue.
- Request permission from speakers before recording or taking photographs during their presentation. Turn off any ringers or otherwise disrupting devices during oral or poster sessions.

Unacceptable Behavior:

It is important that our meeting be a place where no attendee or staff is ever belittled, criticized or made to feel unsafe. The following behavior will not be tolerated:

- Harassment, intimidation, or discrimination in any form.
- Physical, written, or verbal abuse of any attendee, speaker, volunteer, exhibitor, ESA staff member, service provider or other meeting guest.
- Examples of unacceptable behavior include, but are not limited to, verbal comments related to gender, sexual orientation, disability, physical appearance, body size, race, religion, national origin, inappropriate use of nudity and/or sexual images in public spaces or in presentations, threatening or stalking any attendee, speaker, volunteer, exhibitor, ESA staff member, service provider or other meeting guest.

Coat/Bag Check

Attendees will be able to check their coats and bags at the Coat/Bag Check located next to the ESA Registration and Information Center, above the foyer to the Mile High Ballroom. ESA provides this complimentary service to you.

Cyber Café and Charging Station

Sponsored by Bayer CropScience

Science For A Better Life

If you left your laptop at home, we still have you covered! Just head to the Exhibit Hall (Mile High Ballroom) during regular exhibit hours, where you can use the Cyber Café to check your e-mail.

Need a quick charge for your phone, tablet, or other mobile device? Charging stations will be set up in the Cyber Café with power supply and a selection of popular chargers for you to stay connected while in Denver.

Documentary

ESA is excited to partner with a filmmaker to produce a documentary to showcase an entomologically related show during ENTOMOLOGY 2017. The show will be shown in the lobby of the ESA Exhibit Hall (Mile High Lobby) during exhibit hours at 10:00 AM and 12:30 PM (Monday – Wednesday) and 3:00 PM (Monday and Tuesday) via a closed-audio system. Grab a snack and join us to see your favorite insects (and fellow ESA members) on the big screen!

Canadian Broadcasting Company's "The Nature of Things"

Our homes are like mini-ecosystems. For thousands of years — from ancient caves to today's brick houses — insects (as well as some non-insects) have learned to thrive in our homes.

We may see the odd spider, fruit fly, or centipede, but there are many more critters happily sharing our space. A team of American entomologists wanted to understand just what could be found in the average home, so they've been entering homes around the world to undertake their study.

Learn more: cbc.ca/natureofthings/episodes/the-great-wild-indoors

First Aid/Medical Emergencies

The Colorado Convention Center (CCC) is designed to be a safe and relatively risk-free environment. If first aid services are needed while in the convention center, please call building security 303-228-8030 (or from any house phone, dial *200). Please have the following information ready: (1) your exact location, (2) the nature of the emergency, (3) whether the patient is conscious, and (4) whether there are life-threatening injuries, bleeding, etc. There is one permanent First Aid Office located in Lobby E.

Internet Access

Sponsored by Bayer CropScience

Science For A Better Life

ESA and Bayer CripScience is happy to offer complimentary Wi-Fi throughout the convention center. Take advantage of free Wi-Fi to take a break with friends, network, check your e-mail, or Skype with the family back home. Simply choose “ESA” to connect to the network using password “Entsoc2017”.

Lightning Bug Run with City Running Tours

Sunday, November 5
Check-in begins at 6:00 AM | Run begins at 6:30 AM
Advance registration required, $28 per person

Denver’s ever-present sunshine and Rocky Mountain skyline make it a runner's paradise year-round. Learn about the history and culture of Denver, tour public art installations, and climb the stairs of the State Capitol building that mark Denver's mile-high elevation. This unique running tour will be led at different paces to accommodate all levels, with designated stops along the way.

Lost and Found

All lost and found items should be turned into the CCC building security. To contact the security office, please call 303-228-8030 to turn it or retrieve items.

Mobile App

Enhance your experience at ENTOMOLOGY 2017 by downloading the 2017 mobile app. Access the latest program information and schedules, stay organized with the event dashboard, create a personal schedule, link to exhibitors, connect with other attendees, and join in the event chatter with the built-in social media feeds—all from your smartphone, tablet, or ipad. The app is fully integrated with the abstract management system so you will always have the latest information at your fingertips. Downloading the app is easy. For iPhone and Android, visit the App Store or Android Market on your phone and search for ENTSOC 2017.

Mothers’ Room

The Convention Center offers two private spaces for nursing mothers. Stop by the CCC information desk in the main lobby near the blue bear to obtain the location information.

Press

Members of the media who have preregistered can pick up their press passes at the Registration Desk. Those who have not yet registered can request passes; however, proper media credentials must be presented upon arrival at ENTOMOLOGY 2017, and the credentials must show a direct affiliation with an accredited news organization (print, web, TV, or radio) or membership with the National Association of Science Writers (NASW). Public information officers from universities with proper credentials and identification may also receive press passes.

Freelance journalists who do not have media credentials and who are not NASW members will generally not receive press passes, but exceptions will be considered on a case-by-case basis. Requests can be made by calling 240-696-3748.

Companies or organizations producing publications, videos, or other electronic media intended for marketing, advertising, financial analysis, or public relations purposes may not register as members of the media. ESA reserves the right to bar from this and future meetings any registered media personnel who, at the determination of ESA’s Executive Director, misuse media privileges to engage in activities other than journalistic pursuits.

No member of the media will be permitted to record symposia, lectures, meetings, or other events without prior written permission from the organizers and the presenters, and no film or videotape may be broadcast or rebroadcast without prior review and written permission from the organizers. The press contact for ENTOMOLOGY 2017 is Joe Rominiecki; email jrominiecki@entsoc.org or call 240-696-3748.

Restrooms

Restrooms are conveniently located throughout the Convention Center and all surrounding hotel properties and can be found on all maps located on pages 340-341. Gender-neutral restrooms in the Convention Center are located just past meeting room 304 and near the first aid office in the E lobby.

Gender-neutral restrooms at the Hyatt Regency can be found on the fourth floor, second set of restrooms past the escalators.

Social Media

Get connected to ENTOMOLOGY 2017 before you arrive in Denver. Organizers are connected to you via social media in a variety of ways. Use the conference hashtag #EntSoc17 to share your experiences with entomologists around the world!

Twitter: Follow ESA at @EntsocAmerica • Use hashtag #EntSoc17

Facebook: Like the ESA Facebook page at www.facebook.com/entsoc • Use hashtag#EntSoc17

Instagram: Post photos of your experiences in Denver • Use hashtag#EntSoc17

YouTube: Tune in to the ESA YouTube Channel at www.youtube.com/entsoc

Tattered Cover Book Store

A Denver institution, Tattered Cover, a large indie bookstore, will be onsite on Sunday, November 5, to sell copies of Mary Roach's books in advance of the Opening Plenary talk and book signing. Check onsite or the mobile app for sales dates and times.

Visit Tattered Cover's downtown location at 1628 16th Street or browse online at tatteredcover.com.

Tours

All tours will depart from the Registration and Information Center. Please arrive 15 minutes prior to the start so that the tour can promptly depart.

Fun in the Foothills

Saturday, November 4 • 12:00 – 5:00 PM
$155 per person (includes lunch at the Tavern)

Stretches of nature's beauty lay out before you. Breathe in the fresh pine smell and instantly feel the calm wash over you. With an experienced guide at your side, you will explore the stunning forest on foot, taking in all of the magnificent scenery that surrounds every inch of you. From Denver, the fabulous Rocky Mountains are never far away. Your exploration will take you to the foothills where mere steps transform your day from city to mountains in minutes.

Butterfly Pavilion

Sunday, November 5 • 2:00 – 5:00 PM
Wednesday, November 8 • 9:00 AM – 12:00 PM
$35 per person

The Butterfly Pavilion is a nonprofit, invertebrate zoo with the mission of fostering an appreciation of butterflies and other invertebrates while educating the public about the need for conservation of threatened habitats in the tropics and around the world. As the eighth largest cultural facility in Denver, and the first standalone invertebrate zoo to be accredited by the Association of Zoos and Aquariums (AZA), the Butterfly Pavilion sees more than 300,000 visitors a year. Over 5,000 invertebrates call the Butterfly Pavilion home in five unique exhibits. Featured are terrestrial invertebrates in the Crawl-a-See-Em, aquatic invertebrates in Water's Edge, butterflies in Wings of the Tropics, and extreme invertebrates in Invertebrate World. The Outdoor Gardens and Nature Trails support native invertebrates.

Denver Museum of Nature and Science

Tuesday, November 7 • 10:00 AM – 1:00 PM
$45 per person

The Denver Museum of Nature and Science hosts a variety of exhibitions, programs, and activities to help museum visitors learn about the natural history of Colorado, Earth, and the Universe. The 716,000-square-foot (66,519-square-meter) building houses more than one million objects in its collections including natural history and anthropological materials, as well as archival and library resources.

The new Avenir Collections Center represents a quantum leap in collections care. The 63,000-square-foot, two-level facility provides consolidated, state-of-the-art housing for nearly 1.5 million artifacts and specimens for the first time in the museum's 114-year history.

The collections center was custom-made, with the research and collections staff heavily involved in its design and construction, right down to selecting the floor color (white, so that pests can be easily seen). The cabinets were built to specification using the highest standards in stable storage conditions. No longer will specimens, such as butterflies, be shingled or crowded in drawers. Climate control regulates temperature and humidity appropriate to each collection. In newly equipped workspaces and labs, collections can be safely, efficiently, and comfortably studied and preserved by scientists, conservators, and archivists as well as by researchers from around the globe. The new Avenir Collection Center ensures that the stories, science, and wonder inherent in these treasures will endure for generations.

Sunrise Sessions

New this year, the Annual Meeting will feature specialty sessions first thing in the morning prior to the start of the morning scientific program.

There will be five Sunrise Sessions in this year's program:

Achieving Success as a Mentor through Implementation of Effective Mentoring Strategies

Sunday, November 5 • 6:30 – 7:45 AM
Meeting Room 704/706, Convention Center

Mentoring is an important component for success as a scientist. Participants will learn how to become more effective mentors as part of their own professional development and in the context of their own experience and knowledge. Issues impacting mentoring relationships will be addressed through interactive discussions and activities.

"Bugs on Bugs": An Inquiry-Based, Collaborative Activity to Illustrate the Diversity of Arthropods and their Symbionts

Sunday, November 5 • 6:30 – 7:45 AM
Meeting Room 705/707, Convention Center

Attendees will learn about and practice our "Bugs on Bugs" educational activity, in which students sample arthropods and learn about microbial carriages. This activity is designed to connect students in organismal biology and microbiology courses, and attendees are encouraged to collaborate with colleagues to adopt this activity in their courses.

Women in Entomology Breakfast

Monday, November 6 • 6:30 – 7:45 AM
Altitude II, Hyatt Regency Denver

The Women in Entomology Breakfast encourages networking, mentoring, and collegiality, with an emphasis on inspiring more women to enter and stay in entomology and science. We thank Dow AgroSciences for generously sponsoring the breakfasts of the students and post-docs! Open to all interested in promoting women in entomology. Breakfast buffet (for non-sponsored students and post-docs) is $23.13 inclusive of tax and gratuity.

Igniting School Staff and Student Interest in IPM through Innovation

Wednesday, November 8 • 6:30 – 7:45 AM
Meeting Room 703, Convention Center

Designed to assist Extension/Outreach professionals to inspire grassroots groups like school staff and community groups to adopt and sustain IPM programs from research to on the ground implementation. Session will address the need for innovative solutions to common barriers to the delivery of the IPM message to diverse audiences.

USDA-APHIS-BRS and EPA Training on Permitting for Genetically Engineered Insects

Wednesday, November 8 • 6:30 – 7:45 AM
Meeting Room 705, Convention Center

USDA-APHIS Biotechnology Regulatory Services and EPA invite researchers working with genetically engineered insects to meet our entomologists. We will present an overview of USDA and EPA regulations, followed by helpful tips for creating and submitting permits to APHIS for GE insects that are or contain genetic material from plant pests.

University Entomology Clubs

Club representatives will be available to sell T-shirts and more in ESA's Exhibit Hall (Mile High Ballroom) during normal Exhibit Hall hours. As of August 2017, the list of clubs participating includes the following:

- C.V. Riley Entomological Society / University of Missouri
- Entomology Graduate Student Association – The Ohio State University
- Gillette Entomology Club, Colorado State University
- H.O. Lund Entomology Club
- Jugatae, Cornell Entomology Graduate Student Group
- Louisiana State University
- Michigan State University Graduate and Undergraduate Entomology Student Society (GUESS)
- Students of Acarology
- Texas A&M Entomology Graduate Student Organization
- The Entomology Graduate Student Association – University of Illinois
- The Pennsylvania State University Entomology Graduate Student Association
- University of California at Davis Entomology Graduate Student Association
- University of California at Riverside's Entomology Graduate Student Association
- University of Maryland Entomology Student Organization
- University of Minnesota – Frenatae

Purchase this Colorful Print to Commemorate ESA's 65th Annual Meeting!

Continue your collection of ESA commemorative meeting posters! These original signed and numbered silk-screened prints capture the excitement of this year's meeting.

Only 200 posters have been produced so buy yours while they are available!

The poster is 12" by 18" and comes in a sturdy protective envelope.

PRICE: $20.00 if purchased in the ESA booth.

While supplies last.

www.entsoc.org/poster

Continue your collection of ESA commemorative posters.

ENTOMOLOGICAL SOCIETY OF AMERICA

Sharing Insect Science Globally | entsoc.org/annual-meeting

unch and Learns

ignite. inspire. innovate. Entomology 201
NOVEMBER 5–8 • DENVER, C

ndees at Entomology 2017 have the opportunity to get together with friends and colleagues after the morning sessions, have lunch together, a
 something new all at the same time. There will be eight Lunch and Learn sessions this year:

How to Talk to a Nine-Year-Old about Climate Change (and Other Tough Concepts!) Using Informal Invertebrate Education

Sunday, November 5 • 12:15 PM – 1:15 PM
Meeting Room 704/706, Convention Center

s session, we will discuss how to address difficult concepts that arise ientific or public institutions in an accurate yet approachable way. ugh hands-on demonstrations of best practices from Butterfly Pavilion, ill discover methods to deliver effective interpretation that empowers onmental action.

erators: Marissa Copan and Mario Padilla, Butterfly Pavilion

To the Head of the Class: Preparing for Your First Faculty Teaching Position

Sunday, November 5 • 12:15 PM – 1:15 PM
Meeting Room 705/707, Convention Center

ou aspire to teach at a college or university? This interactive session ive students an edge in the job market as they learn how to organize vrite their personalized Teaching Philosophy and Syllabus as well as lop several other important materials for the classroom and teaching olio. Participants are strongly encouraged to bring their tablets and/or ps to this session.

erators: Laura Weiser Erlandson, Texas A&M University; Elizabeth Butin, oke Community College

nspiring Science through Storytelling

Monday, November 6 • 12:15 PM – 1:30 PM
Meeting Room 601/603, Convention Center

al scientific communication is appropriate for providing a detailed rd of inquiry and discovery, but it is not inherently inspiring. Storytelling be a powerful tool to engage humans with science. This interactive on will teach participants how to apply the fundamental tenants of telling to reach diverse audiences.

erators: Robert K. D. Peterson, Montana State University; Rayda K. Krell, ern Connecticut State University

Science Policy 101 for the Entomologist

Monday, November 6 • 12:15 PM – 2:45 PM
Meeting Room 705/707, Convention Center

use local, state, and federal governments determine science policy, nce funding priorities, and funding allocation levels, entomologists be engaged with science policy advocacy. This session will teach cipants about their elected representatives, how to find points of ement, and how to engage with policy makers in a face-to-face setting.

lists: Jason Cryan, ESA Science Policy Fellow (Class of 2016);

This Week in Science Podcast Live Taping!

Monday, November 6 • 12:15 PM - 2:45 PM
Meeting Room 605/607, Convention Center

Come, eat lunch, and be part of the audience for a live taping of the popular podcast, This Week in Science! Hosts Kirsten Sanford, Justin Jackson, and Blaire Bazdarich will interview a number of entomologists that represent the different faces and stories of entomolo

Panelists: Kirsten Sanford, Justin Jackson, and Blaire Bazdarich, *This We in Science*

1, 2...Eyes on You: Classroom Management, Crowd Contr and How to Rock Any Outreach Presentation

Tuesday, November 7 • 12:15 PM - 1:15 PM
Meeting Room 710/712, Convention Center

Kristie Reddick of The Bug Chicks teaches strategies, techniques and tricks to help you rock any outreach event: rowdy, kids or teens, large a small spaces. She will help you feel invincible and inspirational with her battle-tested tips.

Moderator: Kristie Reddick, The Bug Chicks

Creative Writing for Entomologists: Short Forms and Littl Creatures

Tuesday, November 7 • 12:15 PM - 1:15 PM
Meeting Room 704/706, Convention Center

Participants will transform their entomological knowledge into captivatin short-form writing (nano-essays, micro-memoir and flash fiction of 6-60 words) optimal for use on websites and social media—and ideal as see for longer pieces. Knowledge of insects and a sense of playfulness are that are needed for this venture.

Moderator: Jeffrey Lockwood, University of Wyoming

ESA Publications "Ask Me Anything"

Tuesday, November 7 • 12:15 PM - 1:15 PM
Meeting Room 703, Convention Center

Oxford University Press is excited to host an "Ask Me Anything" event featuring editors from ESA publications. Enjoy lunch while editors share what it's really like to lead an academic journal. Don't miss out on this opportunity to get inside the mind of an editor!

Panelists: Dana Nayduch, Subject Editor, *Annals of the Entomological Soc of America*; William K. Reisen, Editor-in-Chief, *Journal of Medical Entomolo* Marlin E. Rice, Editor-in-Chief, *Journal of Integrated Pest Management*; Kevin L. Steffey, incoming (2018) Editor-in-Chief, *American Entomologist*; James B. Whitfield, Editor-in-Chief, *Insect Systematics and Diversity*

Program Information

Uploading Presentations

All presenters are requested to upload their presentation at least 24 hours before the start of the session.

Presenters may upload and/or preview their presentations in the Presentation Preview Room (PPR) located in Meeting Room 210/212 of the Convention Center. If using video files or unusual file-types embedded in your presentation, you must stop by PPR to test the presentation within our system. Student volunteers and Confex employees will be available if you run into problems and need assistance.

Please be aware that if you want to upload your file on the day of your presentation, you can only do so in the presentation room itself, prior to the start of the session or during the break. It is not the responsibility of the Program Committee or the moderator if there is not enough time available to upload the talk. If you are unable to upload your presentation the day prior to your assigned presentation time, it would be considerate to contact the moderator to explain the delay and when you plan to upload the file.

The PPR room is located in Meeting Room 210/212 of the Convention Center. Operating hours are as follows:

Saturday, November 4 • 3:00 – 6:00 PM
Sunday, November 5 • 7:00 AM – 6:00 PM
Monday, November 6 • 7:00 AM – 6:00 PM
Tuesday, November 7 • 7:00 AM – 6:00 PM
Wednesday, November 8 • 7:00 AM – 12:00 PM

Moderator Training

Moderators for symposia, the Student Competition, 10-minute paper sessions, and 3-min presentations are required to attend one of the moderator training sessions. Here you will receive details on equipment operation, light controls, and other responsibilities. Moderators are responsible for keeping the sessions on schedule and must not advance talks in the schedule if one is withdrawn. In case of tardy file presentation uploads, moderators have the right to refuse a presentation, especially if the delay threatens disrupting the rest of the schedule. All moderator training sessions will be held in Meeting Room 501 in the Convention Center. Following are the dates and times for the training sessions:

Saturday, November 4 • 2:00 – 2:30 PM
Sunday, November 5 • 7:00 – 7:30 AM
Monday, November 6 • 7:00 – 7:30 AM

Student Competition Judges' Training

Judges for the Student Competition are required to attend one of the judges' training sessions. Here you will receive details regarding the judging process, criteria, and reporting. All judges must submit their scores online by 6:00 PM on the day of their assigned session.

All judges' trainings will be held in Meeting Room 502 in the Convention Center. The dates and times for the training sessions are as follows:

Saturday, November 4 • 3:00 – 3:30 PM
Sunday, November 5 • 7:00 – 7:30 AM
Monday, November 6 • 7:00 – 7:30 AM

Sunrise Sessions

New this year, the Annual Meeting will feature specialty sessions first thing in the morning prior to the start of the morning scientific program. These sessions provide additional opportunities for networking and education. There will be five Sunrise Sessions:

- **Achieving Success as a Mentor through Implementation of Effective Mentoring Strategies**

  Sunday, November 5 • 6:30 – 7:45 AM
  Meeting Room 704/706, Convention Center

Mentoring is an important component for success as a scientist. Participants will learn how to become more effective mentors as part of their own professional development and in the context of their own experience and knowledge. Issues impacting mentoring relationships will be addressed through interactive discussions and activities.

- **"Bugs on Bugs": An Inquiry-Based, Collaborative Activity to Illustrate the Diversity of Arthropods and their Symbionts**

  Sunday, November 5 • 6:30 – 7:45 AM
  Meeting Room 705/707, Convention Center

Attendees will learn about and practice our "Bugs on Bugs" educational activity, in which students sample arthropods and learn about microbial carriages. This activity is designed to connect students in organismal biology and microbiology courses, and attendees are encouraged to collaborate with colleagues to adopt this activity in their courses.

- **Women in Entomology Breakfast**

  Monday, November 6 • 6:30 – 7:45 AM
  Altitude II, Hyatt Regency

Cost: $23.13 inclusive of tax and gratuity (free for sponsored students and post-docs)

The Women in Entomology Breakfast encourages networking, mentoring, and collegiality, with an emphasis on inspiring more women to enter and stay in entomology and science. We thank Dow AgroSciences for generously sponsoring the breakfasts of the students and post-docs! Open to all interested in promoting women in entomology.

- **Igniting School Staff and Student Interest in IPM through Innovation**

  Wednesday, November 8 • 6:30 – 7:45 AM
  Meeting Room 703, Convention Center

This Sunrise Session is designed to assist Extension/Outreach professionals to inspire grassroots groups like school staff and community groups to adopt and sustain IPM programs from research to on-the-ground implementation. This session will address the need for innovative solutions to common barriers to the delivery of the IPM message to diverse audiences.

- **USDA-APHIS-BRS and EPA Training on Permitting for Genetically Engineered Insects**

  Wednesday, November 8 • 6:30 – 7:45 AM
  Meeting Room 705, Convention Center

USDA-APHIS Biotechnology Regulatory Services and EPA invite researchers working with genetically engineered insects to meet our entomologists. We will present an overview of USDA and EPA regulations, followed by helpful tips for creating and submitting permits to APHIS for GE insects that are or contain genetic material from plant pests.

Workshops

Also new this year, the Program Committee has added four Workshops to the conference schedule. Workshops are focused on science communication and professional development and will engage participants in an interactive educational experience. Advance registration is required for some of the workshops.

- **Ignite, Inspire, and Innovate through Education and Outreach**

  Sunday, November 5 • 1:30 – 5:30 PM
  Meeting Room 705/707, Convention Center

  This workshop is sold out.

The Education and Outreach Committee and Dow AgroSciences Science Ambassadors will lead hands-on activities highlighting STEM themes using insects or insect systems. These activities will be taught in small groups. This workshop will be useful for participants already involved with outreach and those with no prior experience with K-12 programs. For a deeper dive into working with K-12 educators, consider attending the STEMbugs Educator Workshop on Saturday, November 4 (separate registration required).

- **Insect Genome Editing: Why and How**

  Tuesday, November 7, 1:30 – 5:30 PM
  Meeting Room 704/706, Convention Center

Insect genome editing experts will present diverse examples of the application with technical details involved in executing their genome-editing projects. A tutorial on the design, analysis, and synthesis of guide RNAs using web-based tools will be presented. Web-enabled devices are useful but not necessary for the tutorial.

- **Promulgate Your Passion: Techniques to Create, Engage, and Communicate Science**

  Wednesday, November 8, 8:00 AM – 12:00 PM
  Meeting Room 703, Convention Center

This Workshop will feature an introductory multimedia workshop (photography, video, and graphic media basics); oration/presentation techniques (exercises such as crafting elevator pitches for general audiences); and a deep dive into digital/visual creative communication (including hands-on activities that illustrate design fundamentals, the importance of branding, audience identification, and general workflows/processes for creative content production).

- **Making the Switch: A Beginner's Guide to R for Those Familiar with Other Packages**

  Wednesday, November 8, 1:30 – 5:30 PM
  Meeting Room 705, Convention Center

  This workshop is sold out.

Join us for an introduction to key components of R. This interactive workshop will cover importing data, data manipulation, making figures, fitting a model, and making predictions. The workshop is designed for audiences who are new to R, but have some statistics background. Bring your laptop for this hands-on learning!

Lunch and Learn Sessions

Attendees have a great opportunity to get together with friends and colleagues after the morning sessions, have lunch together, and learn something new all at the same time. Unless otherwise specified, lunches are not provided to attendees. Concession options will be available near the Lunch and Learn meeting rooms, so you can quickly purchase your lunch and enjoy it during the presentation.

There will be eight Lunch and Learn sessions:

- **How to Talk to a Nine-Year-Old about Climate Changes (and Other Tough Concepts!) Using Informal Invertebrate Education**

  Sunday, November 5 • 12:15 – 1:15 PM
  Meeting Room 704/706, Convention Center

In this session, we will discuss how to address difficult concepts that arise in scientific or public institutions in an accurate yet approachable way. Through hands-on demonstrations of best practices from Butterfly Pavilion, we will discover methods to deliver effective interpretation that empowers environmental action.

Moderators: Marissa Copan and Mario Padilla, Butterfly Pavilion

- **To the Head of the Class: Preparing for Your First Faculty Teaching Position**

  Sunday, November 5 • 12:15 – 1:15 PM
  Meeting Room 705/707, Convention Center

Do you aspire to teach at a college or university? This interactive session will give students an edge in the job market as they learn how to organize and write their personalized teaching philosophy and syllabus as well as develop several other important materials for the classroom and teaching portfolio. ***Participants are strongly encouraged to bring their tablets and/or laptops to this session.***

Moderators: Laura Weiser Erlandson, Texas A&M University; Elizabeth Butin, Holyoke Community College

- **Inspiring Science through Storytelling**

  Monday, November 6 • 12:15 – 1:30 PM
  Meeting Room 601/603, Convention Center

Formal scientific communication is appropriate for providing a detailed record of inquiry and discovery, but it is not inherently inspiring. Storytelling can be a powerful tool to engage humans with science. This interactive session will teach participants how to apply the fundamental tenants of storytelling to reach diverse audiences.

Moderators: Robert K. D. Peterson, Montana State University; Rayda K. Krell, Western Connecticut State University

- **Science Policy 101 for the Entomologist**

  Monday, November 6 • 12:15 – 2:45 PM
  Meeting Room 705/707, Convention Center

Because local, state, and federal governments determine science policy, science funding priorities, and funding allocation levels, entomologists must be engaged with science policy advocacy. This session will teach participants about their elected representatives, how to find points of agreement, and how to engage with policy makers in a face-to-face setting.

Panelists: Jason Cryan, ESA Science Policy Fellow (Class of 2016); Cindy Simpson, Association for Women in Science; Donna Dean, Association for Women in Science; Erin Cadwalader, Lewis-Burke Associates; and Chris Stelzig, Entomological Society of America

- ***This Week in Science* Podcast Live Taping!**

  Monday, November 6 • 12:15 – 2:45 PM
  Meeting Room 605/607, Convention Center

Come, eat lunch, and be part of the audience for a live taping of the popular podcast, *This Week in Science!* Hosts Kirsten Sanford, Justin Jackson, and Blaire Bazdarich will interview a number of entomologists that represent the different faces and stories of entomology.

Panelists: Kirsten Sanford, Justin Jackson, and Blaire Bazdarich, *This Week in Science*

- **1,2…Eyes on You: Classroom Management, Crowd Control, and How to Rock Any Outreach Presentation**

  Tuesday, November 7 • 12:15 – 1:15 PM
  Meeting Room 710/712, Convention Center

Kristie Reddick of The Bug Chicks teaches strategies, techniques, and tricks to help you rock any outreach event: rowdy, kids or teens, large and small spaces. She will help you feel invincible and inspirational with her battle-tested tips.

Moderator: Kristie Reddick, The Bug Chicks

- **Creative Writing for Entomologists: Short Forms and Little Creatures**

  Tuesday, November 7 • 12:15 – 1:15 PM
  Meeting Room 704/706, Convention Center

Participants will transform their entomological knowledge into captivating short-form writing (nano-essays, micro-memoirs, and flash fiction of 6-60 words) optimal for use on websites and social media—and ideal as seeds for longer pieces. Knowledge of insects and a sense of playfulness are all that are needed for this venture.

Moderator: Jeffrey Lockwood, University of Wyoming

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ESA Publications "Ask Me Anything"

Tuesday, November 7 • 12:15 – 1:15 PM
Meeting Room 703, Convention Center

Oxford University Press is excited to host an "Ask Me Anything" event featuring editors from ESA publications. Enjoy lunch while editors share what it's really like to lead an academic journal. Don't miss out on this opportunity to get inside the mind of an editor!

Panelists: Dana Nayduch, Subject Editor, *Annals of the Entomological Society of America*; William K. Reisen, Editor-in-Chief, *Journal of Medical Entomology*; Marlin E. Rice, Editor-in-Chief, *Journal of Integrated Pest Management*; Kevin L. Steffey, incoming (2018) Editor-in-Chief, *American Entomologist*; and James B. Whitfield, Editor-in-Chief, *Insect Systematics and Diversity*

**Boxed lunches will be provided to the first 50 attendees courtesy of Oxford University Press.*

Opening Plenary Session with Keynote Speaker Mary Roach

Sunday, November 5 • 5:30 – 7:30 PM
Four Seasons Ballroom, Convention Center

Introduction of Executive Committee

Introductory Remarks
Susan J. Weller, *President*

Presidential Address
Susan J. Weller, *President*

ICE 2020 Helsinki
Heikki Hokkanen, *ICE 2020 Helsinki Organizing Committee Chair*

ESA Executive Director Remarks
C. David Gammel, *Executive Director*

Entomological Foundation Update
May R. Berenbaum, *Entomological Foundation President*

ESA Honorary Members and ESA Fellows
Susan J. Weller, *President*

Foundation Medal of Honor
May R. Berenbaum, *Entomological Foundation President*

Plenary Presentation and Conversation with Mary Roach, facilitated by Gwen Pearson of Purdue University.

Mary Roach is the author of the *New York Times* bestsellers *Gulp: Adventures on the Alimentary Canal; Packing for Mars: The Curious Science of Life in the Void; Stiff: The Curious Lives of Human Cadavers; Bonk: The Curious Coupling of Science and Sex; Spook: Science Tackles the Afterlife*; and her latest, *Grunt: The Curious Science of Humans at War*. *Packing for Mars* is a *New York Times* Editor's Choice and a "One City, One Book" selection for San Francisco. *Stiff* has been translated into 26 languages and *Spook* was a *New York Times* Notable Book. Ms. Roach has written for *National Geographic*, *Wired*, *New Scientist, The New York Times Book Review, The Journal of Clinical Anatomy*, and *Outside*, among others.

She serves as a member of the Mars Institute's Advisory Board and the Usage Panel of American Heritage Dictionary. Her 2009 TED talk made the organization's 20 Most-Watched to Date List in 2011. She was the guest editor of *The Best American Science and Nature Writing 2011* and a winner of the American Association of Engineering Societies' Engineering Journalism Award, in a category for which she was the sole entrant.

Concluding Remarks

Susan J. Weller, *President*

Adjourn to the Welcome Reception, Mile High Ballroom, Convention Center

Awards Breakfast Featuring the Founders' Memorial Lecture

Tuesday, November 7 • 7:30 – 9:00 AM
Four Seasons Ballroom, Convention Center

$5 Student Members | $7.50 ECP Members
$10 Regular Members | $20 Non-Members

Join us for ESA's first ever Awards Breakfast. Help recognize your colleagues and peers for their outstanding achievements as award winners. All ESA Professional Awards, ECP Awards, Certification Corporation Awards, and Entomological Foundation Awards will be recognized at this breakfast, along with the Founders' Memorial Lecture featuring Dr. Carol Anelli.

Tickets are required and can be purchased at the ESA Registration Desk. Full breakfast buffet is included and will open at 7:30 AM. The awards program and Founders' Memorial Lecture will begin at approximately 7:50 AM.

Founders' Memorial Lecture Honoring Dr. Anna Botsford Comstock

Dr. Carol Anelli, a professor and interim chair of the Department of Entomology at The Ohio State University, has been selected to deliver the Founders' Memorial Award lecture at ENTOMOLOGY 2017 during the ESA Awards Breakfast, beginning at 7:30 AM on Tuesday, November 7.

The subject of Dr. Anelli's lecture will be **Anna Botsford Comstock** (1854-1930), the first woman professor at Cornell University, known for her books on nature and conservation and for her wood-engraved illustrations of insects. She was the wife of John H. Comstock, a professor of entomology at Cornell and chief entomologist for the U.S. Department of Agriculture from 1879 to 1881. Her art gained recognition as it appeared in textbooks and publications written by her husband, and later she illustrated several of her own books, such as *How to Keep Bees, Insect Life*, and *The Handbook of Nature Study*. Comstock was also a pioneer in designing nature study curricula that brought teachers and students outdoors.

Dr. Anelli is the fourth woman to be awarded the Founders' Memorial Award, and Comstock is the third female honoree. This will be the first time in the award's 60-year history that both lecturer and honoree are female.

Dr. Anelli's career in entomology spans more than four decades, during which she has become renowned as both a researcher and an educator. Her research achievements include the publication of 36 refereed articles and one book chapter, spanning both insect physiology and science education methods. She has received multiple awards for her teaching, including ESA's Distinguished Achievement Award in Teaching in 2009. Prior to joining Ohio State, Dr. Anelli served on the faculty for 17 years at Washington State University, first as a professor of entomology and later as faculty fellow in the Office of Assessment of Teaching and Learning. She also is deeply versed in the history of entomology, and her early career briefly took her to the same grounds once home to Anna Comstock, when she spent the summer of 1990 as a historical/archival research associate for Dr. Edward H. Smith, emeritus professor of entomology at Cornell.

"The recognition of Anna Comstock is very appropriate for the theme of our national meeting, as Anna has inspired so many of us over the decades to pursue the study of insects," says Gene Kritsky, Ph.D., dean of the School of Behavioral and Natural Sciences at Mount St. Joseph University and editor-in-chief of ESA's quarterly magazine, American Entomologist. "Moreover, Carol, a gifted educator herself, is uniquely qualified to present the Founders' Memorial Lecture to document Anna Comstock's many contributions."

Members of ESA's Early Career Professionals Committee nominated Dr. Anelli for the award, noting: "Loved by her students, admired by her colleagues, and an inspiration to entomologists across the United States, Carol possesses the key qualities required for successful entomological education in the digital age. Combined with her expertise on historical and cultural entomology, there are few others who would be better to speak on the like-minded educator and teacher, Anna Comstock."

Student Awards Ceremony

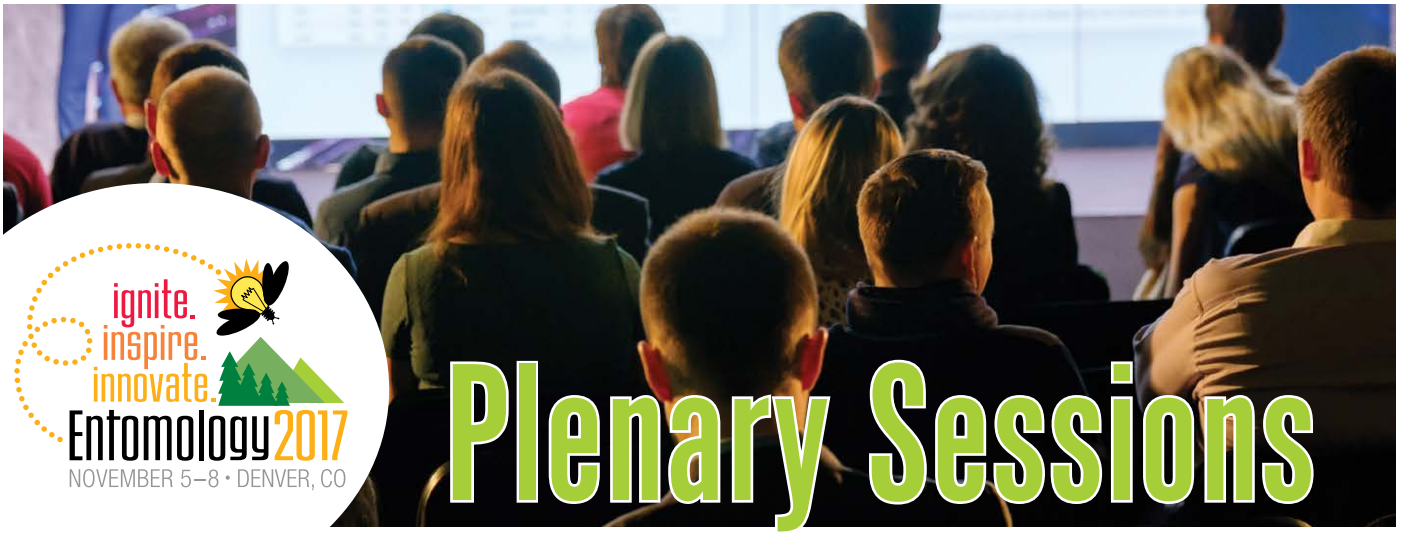
Tuesday, November 7 • 6:30 – 8:00 PM
Four Seasons Ballroom, Convention Center

Join Alix Whitener and Casey Parker as they host the Student Awards Ceremony before the Student Reception. The winners of the ESA Student Awards, Student Debates, and Linnaean Games will be recognized and the winners of the President's Prize Student Competition will be announced for the first time by the Student Competition co-chairs. You will not want to miss this noteworthy event!

Closing Plenary Session

Wednesday, November 8 • 12:15 – 1:30 PM
Four Seasons Ballroom, Convention Center

We've scheduled the Closing Plenary earlier in the day so that everyone can join us as ESA President Susan Weller thanks the ENTOMOLOGY 2017 team and passes the gavel to Vice President Michael Parrella. Michael will share his plans for 2018, including a preview of the Joint 2018 Meeting with the Entomological Society of Canada and the Entomological Society of British Columbia in Vancouver, BC, November 11-14, 2018. You will not want to miss hearing what the future will bring with our Canadian partners! Winner of the Entomological Foundation raffle will be announced at the conclusion of the program.



Plenary Sessions

ENTOMOLOGY 2017 will feature several plenary sessions throughout the meeting that will bring everyone together. Be sure to arrive early to get your space!

All events take place in the Four Seasons Ballroom of the Convention Center.

Opening Plenary with Keynote Speaker Mary Roach

Sunday, November 5 • 5:30 – 7:30 PM

SUSAN WELLER

MARY ROACH

Join President **Susan Weller** to kick off ENTOMOLOGY 2017 in style and hear about all of ESA's advances over the past year as well as recognize our newest ESA Honorary Members and Fellows.

We are excited to end the plenary session with a sit-down conversation with science communicator and *New York Times* bestselling author **Mary Roach**, facilitated by Gwen Pearson of Purdue University. Mary will be sharing with us her research experiences and telling us what inspires her to write so many books that our members love!

NEW

ESA's Awards Breakfast

Tuesday, November 7 • 7:30 – 9:00 AM

CAROL ANELLI

Get your ticket for ESA's first ever awards breakfast honoring all ESA Professional, Early-Career Professional, Certification Corporation, and Entomological Foundation awardees. **Carol Anelli** will be our featured speaker for the Founders' Memorial Lecture honoring Anna Botsford Comstock.

$5 Student Members | $7.50 ECP Members
$10 Regular Members | $20 Non-Members

ESA's Student Awards Ceremony

Tuesday, November 7 • 6:30 – 8:00 PM

ALIX WHITENER

CASEY PARKER

The ESA Student Awards Ceremony honors all student award winners, including the Student Competition for the President's Prize first announced during the ceremony. Hosted by **Alix Whitener** and **Casey Parker**, chair and vice-chair of the Student Affairs Committee, this event will be immediately followed by the Student Reception taking place at the Wynkoop Brewery.

Shuttle transportation will be provided to/from the Convention Center and the Wynkoop Brewery immediately following the Student Awards Ceremony.

Closing Plenary Session

Wednesday, November 8 • 12:15 – 1:30 PM

MICHAEL PARRELLA

We've moved up the Closing Plenary to be sure you can attend! Here, we will reflect on the week and look forward to the 2018 Joint Annual Meeting in Vancouver, BC. Get a preview of next year's meeting from ESA's 2018 President **Michael Parrella** as he shares all of the planning that has already taken place between ESA, the Entomological Society of Canada and the Entomological Society of British Columbia.

Poster Presentations

Printed Posters

The Program Committee has scheduled three days of poster sessions for the Annual Meeting. Posters are numbered sequentially in the program book and, where possible, grouped according to ESA Section and subject matter. Authors must display their posters on the board bearing the same number as that indicated in the program book for each poster.

Poster Size: Each poster must be contained within the 46x46 inch (117 x 117 cm) space provided. Two posters will be displayed on each side of a single board (four posters per board). The poster must NOT exceed the size limit. Please be considerate of the person with whom you are sharing a display space.

Setup: *For Posters within Symposia*: You may display your poster 30 minutes prior to the start of the symposium and up to 30 minutes after the end of the symposium. **Bring your own Velcro strips (push pins are not allowed in the Convention Center hallways) to secure your display to the poster board.** The poster board is covered with felt cloth and the frame is aluminum. Please do not attach anything to the metal frame.

For Student Competition and Contributed Posters: Your poster must be placed in the assigned space in the Exhibit Hall the night before your poster is scheduled, i.e., Sunday (7:30–9:30 PM), Monday (8:00– 9:30 PM), and Tuesday (8:00– 9:30 PM). **Bring your own Velcro strips (push pins are not allowed in the Exhibit Hall) to secure your display to the poster board.** The poster board is covered with felt cloth, and the frame is aluminum. Please do not attach anything to the metal frame.

Poster Presentation Times:
For Posters within Symposia: Each symposium has designated a specific time for poster presenters to be present at their posters. Presenters are expected to be available at their displays during the "Poster Session" time slot for questions and discussion. Check your symposium schedule for exact times.

For Student Competition and Contributed Posters: Because the Exhibit Hall becomes quite congested during presentation hours, presenters of posters with odd and even numbers are assigned specific times to be present at their posters. Presenters are expected to be available at their displays during the "Authors Present" time slot for questions and discussion. A cash bar reception area will be set up within the poster display area during presentation times. The schedules below include the times of expected author availability:

Sunday, November 5 (Highlighted Posters):

Setup: 5:30 – 7:30 PM

Viewing: Available starting 7:30 PM on Sunday, November 5, until 2:30 PM Wednesday, November 8

Authors Present: Posters with odd numbers: 7:30 – 8:00 PM; Posters with even numbers: 8:00 – 8:30 PM

Takedown: Wednesday, 2:30 – 3:30 PM

Monday, November 6:

Setup: Sunday, 7:30 – 9:30 PM

Viewing: Monday, 8:00 AM – 6:30 PM

Authors Present: Posters with odd numbers: 5:30 – 6:00 PM; Posters with even numbers: 6:00 – 6:30 PM

Takedown: Monday, 6:30 – 7:30 PM

Tuesday, November 7:

Setup: Monday, 8:00 – 9:30 PM

Viewing: Tuesday, 8:00 AM – 6:30 PM

Authors Present: Posters with odd numbers: 5:30 – 6:00 PM; Posters with even numbers: 6:00 – 6:30 PM

Takedown: Tuesday, 6:30 – 7:30 PM

Wednesday, November 8

Setup: Tuesday, 8:00 – 9:30 PM

Viewing: Wednesday, 8:00 AM – 2:30 PM

Authors Present: Posters with odd numbers: 11:00 – 11:30 AM; Posters with even numbers: 11:30 AM – 12:00 PM

Takedown: Wednesday, 2:30 – 3:30 PM

Poster Removal: Posters should be removed promptly between 6:30 and 7:30 PM on Monday and Tuesday, and between 2:30 and 3:30 PM on Wednesday. Please do not remove your poster before the close of the scheduled viewing time. Do not remove poster numbers when removing posters from boards.

Virtual Posters

Virtual posters provide a unique opportunity to view the research of entomologists from across the globe who cannot attend ENTOMOLOGY 2017 in person. These electronic posters will be positioned in the Exhibit Hall near the printed posters on large, flat-screen monitors. Attendees will be able to scroll through the virtual posters throughout the day to view the variety of research taking place around the world and listen to short introductions by the presenter.

Highlighted Posters

New this year, the Program Committee has selected ten posters to be honored at the Annual Meeting as Highlighted Poster presentations. Highlighted posters were chosen based on the abstract and title content of submissions that exemplify the meeting theme of 'ignite. inspire. innovate'. Posters chosen will be on display outside of the main entrance of the Exhibit Hall throughout the entire Annual Meeting for maximum exposure to attendees.

Social Activities & Mixers

New Member Meet & Greet Ice Cream Social Reception

Sunday, November 5, 4:30 – 5:30 PM
Meeting Room 703, Convention Center

If you are a new ESA member this year, you are invited to our New Member Meet & Greet Reception to enjoy an ice cream social. Mingle with other new members, and meet ESA leaders and staff. Learn how to take maximum advantage of ESA membership benefits, and how to navigate the ENTOMOLOGY 2017 Annual Meeting. Light refreshments will be served. New members should have received a special invitation to the reception via email—please bring it and exchange it for a special ESA welcome gift!

Welcome Reception

Sunday, November 5, 7:30 – 9:30 PM
Mile High Ballroom, Convention Center

You are cordially invited to attend the Welcome Reception on Sunday evening in the Exhibit Hall (Mile High Ballroom) immediately following the Opening Plenary Session (Four Seasons Ballroom). This is a great opportunity to have time with the exhibitors and colleagues and learn about the latest resources and tools available to entomologists. Highlighted Posters will be on display in the foyer space, and presenting authors will be on-hand to answer any questions or discuss their research in-depth. Grab some light refreshments and a drink, network with colleagues and friends, and check out the posters.

Social Hour with Poster Presenters

Join us for our Social Hour with Poster Presenters each day of the meeting during poster presentation hours in the Exhibit Hall (Mile High Ballroom, Convention Center).

Highlighted Posters

Sunday, November 5, 7:30 – 8:30 PM

Student Competition Posters

Monday, November 6, 5:30 – 6:30 PM

Poster Presentations

Tuesday, November 7, 5:30 – 6:30 PM
Wednesday, November 8, 11:00 AM – 12:00 PM

Student Activities

Linnaean Games

Preliminary Round: Sunday, November 5, 1:00 – 3:00 PM
Four Seasons Ballroom, Convention Center

Final Round: Tuesday, November 7, 5:00 – 6:30 PM
Four Seasons Ballroom, Convention Center, followed immediately by the Student Awards Ceremony and Student Reception

Be sure to check out the Linnaean Games (entsoc.org/linnaeangames), a "College Bowl"-type competition that is one of the more spirited sessions of our annual meetings. Stop in and cheer on your favorite team! Winners and runners-up will be recognized at the Student Awards Ceremony immediately following the Linnaean Games Finals on Tuesday evening.

Student Competition for the President's Prize

Sunday, November 5 – Monday, November 6
Various times and locations, Convention Center

To support student attendees and encourage them to become more involved in the world of entomology, Sunday and Monday mornings are dedicated to the student paper competition. There are 79 sessions containing graduate and undergraduate student 10-minute oral presentations, three-minute oral presentations, posters, and virtual posters. A full list of presentations for all formats of the Student Competition can be found starting on page 105. Stop by and show your support for the students! This year's first-place winners will receive a $75 USD cash prize, complimentary 2018 ESA membership, and a certificate. A complimentary 2018 ESA membership and a certificate will be awarded to second-place winners.

Student Debates

Tuesday, November 7, 1:00 – 4:00 PM
Four Seasons Ballroom, Convention Center

The main 2017 Student Debate theme is "The Anthropocene: Implications for Arthropods and Biodiversity."

Two student teams have chosen to debate what they believe is the most important threat to global arthropod biodiversity.

Another debate will focus on the most urgent and feasible use for CRISPR/Cas9 in entomology.

The final debate will concern the best way to increase beneficial insect diversity in urban areas.

All three debates will be interesting, informative, and entertaining. Audience members are welcome to ask questions at the end of each debate. Come cheer on your favorite team!

Student Awards

Tuesday, November 7, 6:30 – 8:00 PM
Four Seasons Ballroom, Convention Center

The winners of the President's Prize, ESA Student Awards, Student Debates, and Linnaean Games will be recognized. After the conclusion of the program, shuttle service will be provided to the off-site Student Reception.

Student Reception

Tuesday, November 7, 8:00 – 11:00 PM
Wynkoop Brewery, 1634 18th Street

We are taking over Denver's original craft brewery for the night! Located near Union Station at the corner of 18th and Wynkoop, the Wynkoop Brewery is the perfect venue to host ESA's annual Student Reception. Mix and mingle as you spend the night sampling the seasonal offerings of the venue (or any other beverage) as you explore the space and activities available to you throughout the evening. In addition to a rockin' dance floor, the second floor features billiards tables, shuffleboards, and darts—and we are bringing back all our oversized games. Brewery tours will be available for those interested in hearing about the history and background of the brewers and the on-site brewing process.

All registered students and recent graduates are invited to attend—please be sure to have your ID and name badge as proof of registration. Shuttle service will be provided from the convention center to Wynkoop following the Student Awards ceremony.

Student Volunteers

Volunteers can pick up their volunteer T-shirt from the volunteer coordinator at the Registration and Information Center located in Concourse E, above the Mile High Lobby of the Convention Center, prior to the start of their first shift. All volunteers should report to their designated assignments 15 minutes before the start of their shift. Needed materials will be provided by ESA. If you cannot make it to your assignment or you need additional information, please see the volunteer coordinator at the Registration and Information Center.

Entomological Foundation

The Entomological Foundation is now being managed by the staff of ESA out of the Annapolis, MD, headquarters office. Our mission is: *Exciting young people about science through insects and building a future for entomology!*

Learn more about the Foundation at the ESA Central Booth on the Exhibit Hall floor.

Teacher Workshop

Saturday, November 4, 10:00 AM – 2:00 PM
Meeting Room 301/302, Convention Center

The Entomological Foundation is once again offering a teacher workshop developed for educators in grades K–12. Educators from Colorado and the surrounding areas will join us to learn how to increase science literacy in their students through the use of live insects in the classroom. This practical and hands-on educational session is a great learning opportunity for teachers. Registration is just $10.

STEMbugs is generously supported by the Kenneth W. Gilstrap Fund (www.entfdn.org/pr_wksp_gilstrap). For more information on the workshop, including a registration form, find us online at www.entfdn.org/pr_workshop.

Silent Auction

A long-standing and popular tradition of the ESA Annual Meeting is the Entomological Foundation's Silent Auction and Raffle, located in the ESA Central Booth on the Exhibit Hall floor. This shopping event has become a go-to destination for many ESA Annual Meeting attendees as a fun place to get some insect-themed holiday gifts while making a meaningful contribution to the future of the profession.

The Silent Auction will feature insect-themed jewelry, clothing, books, crafts, and other great items donated by your professional colleagues. All proceeds will go directly to the Foundation in support of our mission of developing a love of science in children through insects. The Silent Auction will be open during the regular ESA Central booth hours and **all bids become final at 5:00 PM Tuesday, November 7**. Winning bids must be picked up by 12:00 PM on Wednesday, November 8, or they will be sold to the next highest bidder. **Successful auction sales cannot be shipped by the Foundation.**

Learn more at www.entfdn.org/pr_auction.

Raffle

Win an iPad mini or a VIP trip to the ESA 2018 meeting in Vancouver, BC, Canada!

Your raffle ticket purchases do more than help fund the mission of the Foundation. They could also get you a free trip to Vancouver. The grand prize package includes air travel (up to a $500 voucher), plush hotel accommodations for four nights, an invitation to the ESA Governing Board Reception, ground transportation to and from the airport, and more! The prize package has an estimated retail value of nearly $2,000! Ticket prices are one for $5, three for $10, five for $15, or get 10 raffle tickets for $20. Buy your tickets online through Monday, October 30, at www.entfdn.org/pr_raffle.html.

Exhibit Hall

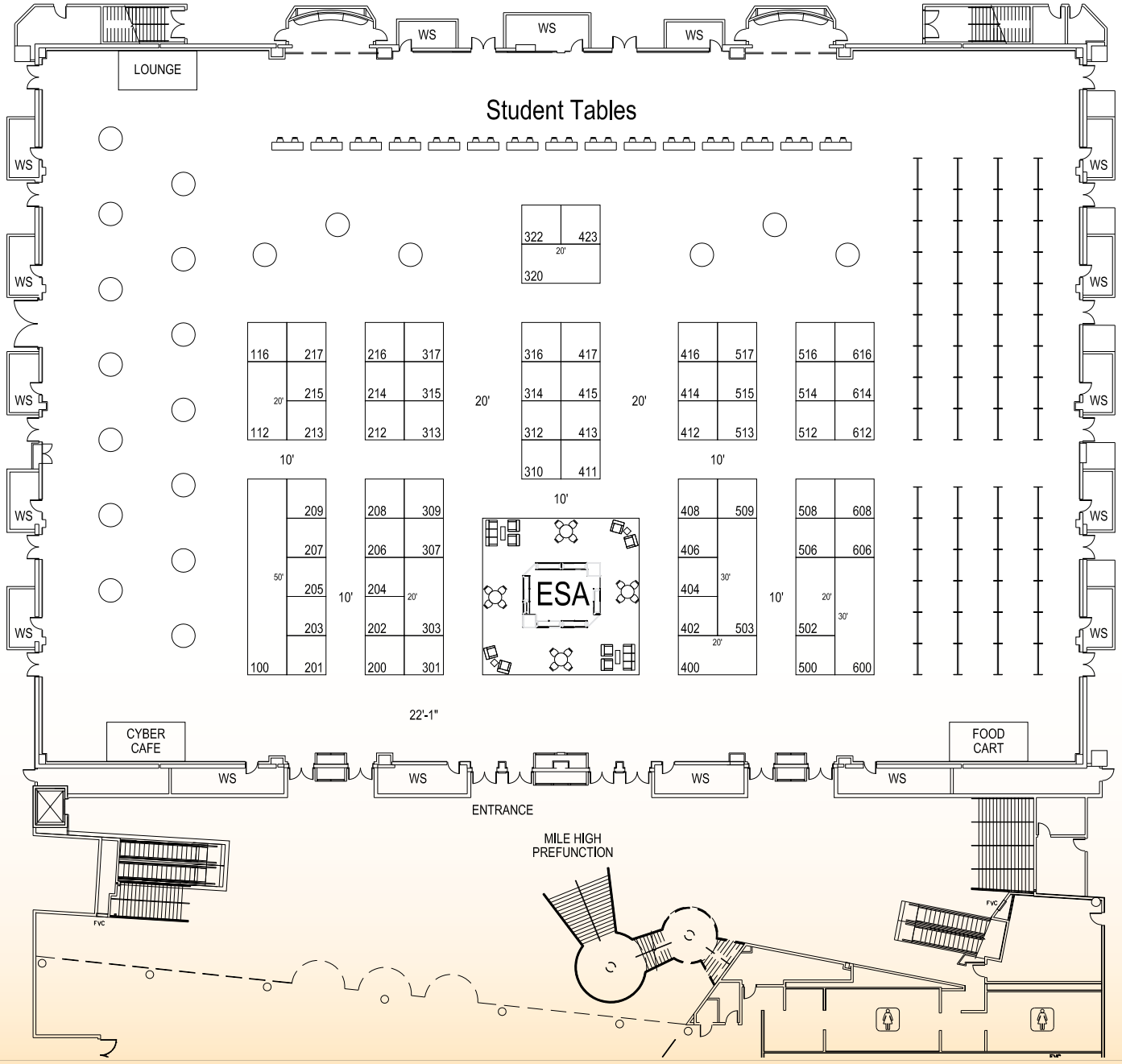
The ESA Exhibit Hall will feature exhibitors, poster presentations, virtual posters, a cyber café and charging station, and student club tables in the Mile High Ballroom in the Convention Center. Our exhibitors have the latest entomological equipment, supplies, gifts, and reference materials.

EXHIBIT HALL HOURS

Sunday, November 5	7:30 – 9:30 PM
Monday, November 6	9:00 AM – 5:00 PM
Tuesday, November 7	9:00 AM – 5:00 PM
Wednesday, November 8	9:00 AM – 2:00 PM

Exhibit Hall Map

Colorado Convention Center, Mile High Ballroom



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A WEALTH OF RESOURCES AT YOUR FINGERTIPS

Visit the OUP booth (503) to learn more about the ESA publications. **For on the go research, don't miss out on the chance to win a free pair of touchscreen gloves!**

Grab a copy of the latest issue of *Annals of the Entomological Society of America* from registration or the OUP booth, and check for a winning ticket!

And join us at our "Ask Me Anything" Q&A Lunch & Learn Tuesday, November 7 12:15-1:15 pm in Meeting Room 703.
Enjoy lunch while editors from ESA publications answer your questions about what it's really like to lead an academic journal. Don't miss out on this opportunity to get inside the mind of an editor!

Exhibitors

ADAPCO, an Azelis Americas Company — Booth: 502

Sanford, FL
Website: **www.myadapco.com**

ADAPCO has been serving the Mosquito Control community since 1985. Throughout the last 32 years, ADAPCO has represented the nation's leading manufacturers of Mosquito Control products. Now, ADAPCO is part of Azelis Americas. Azelis Americas is dedicated to providing leading-edge products, services, equipment, and technologies for the Mosquito Control industry.

Alpha Scents, Inc. — Booth: 402

West Linn, OR
Website: **www.alphascents.com**

A global supplier of quality insect monitoring systems, traps, lures, attract & kill, and MalEx, designed to reduce toxic pesticide use. Products for most native and exotic species in agriculture, horticulture, ornamentals, forestry, and the home & garden PestWizard brand. Custom pheromone synthesis for research, manufacturing, and government. Made with high-purity pheromones per recommendations from the research community.

Ant Life — Booth: 515

Boulder, CO
Website: **www.antlife.space**

An Ant Space is a living, evolving art piece. A thin habitat rests invisibly within an expertly crafted wooden frame. Create a beautiful environment using black soil and colored sand. Add seeds and ants to give life to the Ant Space. Floating islands will break free to drift across a vibrant nebula, pulsing in a rainbow of colored light. The Ant Space will evolve over years, guided by your subtle touch.

Atlas Screen Printing — Booth: 411

Gainesville, FL
Website: **www.wildcotton.com**

We have the fun stuff! T-shirts, jewelry, kids' stuff, puzzles, mugs, magnets, tote bags, caps, and much more. Just a few three-for-one grab bags. Come early, come often. Most products endemic to this show. Christmas presents you will find nowhere else!

BASF — Booth: 400

Research Triangle Park, NC
Website: **www.basf.com**

BASF Crop Protection provides innovative solutions for agriculture, turf and ornamental plants, pest control, and public health. Our broad portfolio of active ingredients, seed treatments, biological controls, formulations, and services optimizes efficient production of high-quality food and protects against post-harvest loss, damage to buildings, and the transmission of disease.

BioQuip Products — Booth: 100

Rancho Dominguez, CA
Website: **www.bioquip.com**

BioQuip has been providing equipment and books for use in the field, lab, museum, and classroom since 1947. Our 28 employees hold a valuable diversity of knowledge with more than 395 years of combined experience.

BRILL — Booth: 202

Leiden, The Netherlands and Boston, MA, USA
Website: **www.brill.com/search/subject/science/subject/biology/subject/entomology**

Founded in 1683, Brill is a publishing house with a rich history and a strong international focus. The company's head office is in Leiden (The Netherlands), with branch offices in Boston, MA (USA) and Singapore. Visit our booth to learn about the success of our journal *Insect Systematics & Evolution*, and browse our latest books as well as KNNV Publishing titles and those formerly with Apollo Books.

Bruker BioSpin — Booth: 509

Kontich, Belgium
Website: **www.bruker-microct.com/home.htm**

Bruker develops and produces X-ray microtomography instruments for non-destructive 3D imaging of objects' internal microstructure with spatial resolution on the micron level. More than 1,000 installations around the world proofed high-quality and reliability of the instruments with comprehensive application support and service.

Our range of techniques includes magnetic resonance imaging (MRI), PET/MRI imaging, Optical Imaging, PET/SPECT/CT imaging, microCT, and magnetic particle imaging (MPI). For more information, visit www.bruker.com.

Bugwood Center — Booth: 206

Tifton, GA
Website: **www.bugwood.org**

We help detect pests, prevent new infestations, respond to introductions, and manage ecosystem health. With our partners (including USDA APHIS PPQ, Regional IPM Centers, and iPiPE), we provide access to relevant information and tools. This empowers stakeholders to make cost-effective management decisions that minimize non-target impacts while effectively controlling pests.

CABI/CSIRO — Booth: 209

Sterling, VA
Website: **www.styluspub.com**

CABI is a not-for-profit international organization that improves people's lives by providing information and applying scientific expertise to solve problems in agriculture and the environment. Our mission and direction are influenced by our member countries who help guide the activities we undertake.

Cambridge University Press — Booth: 608

New York, NY
Website: **cambridge.org/academic**

Cambridge University Press is a not-for-profit organization that dates from 1534 and is part of the University of Cambridge. Our mission is to unlock people's potential with the best learning and research solutions by combining state-of-the-art content with the highest standards of scholarship, writing and production. Visit our stand to browse new titles, available at 20% discount, and pick up free journal sample copies.

Canadian Centre for DNA Barcoding — Booth: 415

Guelph, Ontario
Website: **www.ccdb.ca**

The Canadian Centre for DNA Barcoding (CCDB) is the world's largest analytical hub with the primary goal of delivering the most reliable and comprehensive species identification platform on the planet. The CCDB is the birthplace of DNA barcoding, proudly serving clients from private, government, and academic sectors in over 50 countries.

Carl Zeiss Microscopy, LLC — Booth: 116

Thornwood, NY
Website: **www.zeiss.com/microscopy/us**

As the world's only manufacturer of light, X-ray, and electron/ion microscopes, ZEISS offers tailor-made microscope systems for 3D imaging in biomedical research, life sciences, and healthcare. A well-trained sales force, an extensive support infrastructure, and a responsive service team enable customers to use their ZEISS microscopes to their full potential.

Celestron — Booth: 517

Scappoose, OR
Website: **www.celestron.com**

Cleopatra Gems Co. Ltd — Booth: 217

Maesai, Chaing Rai, Thailand
Website: **www.cleopatragem-shop.com**

Our company has been selling the unique natural amber of Myanmar called burmite for a decade. Since then, we have been providing high-quality burmite for the gemologists as well as entomologists in order to study insects embedded in the fossils nearly 100 million years ago.

Conviron — Booth: 307

Winnipeg, MB, Canada
Website: **www.conviron.com**

Conviron is a global supplier of controlled environment systems with primary application in Agricultural Biotechnology research. Our extensive product portfolio includes single and multi-tier chambers and rooms, and research greenhouses. Services encompass the entire project life cycle from early-stage design through to installation, project commissioning, and ongoing maintenance and support.

Cornell University Press — Booth: 404

Ithaca, NY
Website: **www.cornellpress.cornell.edu**

Cornell University Press publishes well-designed works of lasting merit and scientific rigor in natural history, conservation science, and ecology. Visit the Cornell booth to see our most recent titles and discuss potential book projects with Science Editor Kitty Liu.

Cricket Science — Booth: 310

Pocatello, ID
Website: **www.cricketscience.com**

Cricket Science offers a variety of *one-of-a-kind* eclectic items of interest to insect enthusiasts and entomologists, including antiquarian books, prints, jewelry, Baltic amber, cards, cricket cages, checkbook covers, stamps, etc. Prepaid shipping available; all credit cards accepted. See the "anderobe" store on eBay or send email for books and other items not at the convention.

Dino-Lite Scopes (BigC) — Booth: 313

Torrance, CA
Website: **www.dinolite.us**

Dino-Lite portable digital microscopes and eyepiece cameras provide high-quality microscopy video interfacing to PC and MAC with clear and steady imaging. Most models provide 10x-220x magnification along with included software with features such as image and video capture, measurement, and annotation capabilities. Units with 5MP resolution, Extended Depth of Field, Automatic Magnification Reading, and Flexible LED Control are available.

Dragons Wynd — Booth: 606

Minneapolis, MN
Website: **www.dragonswynd.com**

Entomology Outreach and Education. All ages, and all types of engagement. Great public speaker and very good with large school groups. Jessica has specialized many topics for classes and garden groups, such as predator/prey, pollinators, aquatic insects, and others.

ELSEVIER — Booth: 309

San Diego, CA
Website: **www.elsevier.com**

Elsevier is your access point into the recent advancements in entomology, providing cutting-edge research from worldwide experts. Explore the latest in research via our exciting books and journals on display such as *Insect Ecology, 4th Edition*; *Current Opinion in Insect Science*; *Microbial Control of Insect and Mite Pests*; and *Journal of Insect Biochemistry and Molecular Biology*. Discover our digital solutions to your research on ScienceDirect!

Entomological Society of America — Center Booth

Annapolis, MD
Website: **entsoc.org**

The "ESA tower" located in the center of the Exhibit Hall provides you with a relaxing spot to meet a colleague and rest your feet after a long day of walking, and offers a welcoming place to learn about the many benefits of ESA membership. ESA HQ staff are on hand to share information on ESA programs and activities and answer any questions you have about ESA or the meeting. And members of ESA's Diversity & Inclusion Committee will be on hand to answer questions about their work. Take a minute to renew your membership and receive a nice gift for doing so. You may also purchase an ESA publication, have your business card laminated into a free luggage tag, learn about ESA's certification program, purchase a copy of the 2018 World of Insects calendar, or view and bid on the Entomological Foundation Silent Auction items.

Frontier Scientific — Booth: 316

Newark, DE
Website: **www.fsiag.com**

Frontier Scientific is a leading provider of high-quality insect products supporting agricultural insecticide research. These include custom diets, consumables, and insect rearing of several species. The agricultural services division complements Frontier's preeminent contract services business model supporting R&D organizations in pharma, biotech, and agricultural research organizations.

GIGAmacro — Booth: 320

Napa, CA
Website: **www.gigamacro.com**

The GIGAmacro Magnify2 is designed for creating gigapixel (and larger) high-resolution imagery of macroscopic and microscopic subjects. The complete, turn-key system provides the robotics, optics, camera, and software, to create Gigamacro images. It combines the latest imaging advancements, software, hardware, and online viewing technology into one system at an affordable price. Deploy your images on a local machine, local web or cloud solution using our GIGAmacro Viewer.

Gylling Data Management — Booth: 301

Brookings, SD
Website: **www.gdmdata.com**

Gylling Data Management has been providing research management software since 1982. See the new ARM 2016 used to establish, manage, analyze, and report information for crop experiments including field and greenhouse protocols and trials. Also the new HarvestMaster Mesa2 Tablet Data Collector: enter and analyze assessments, take plot pictures, and record trial GPS locations. ST: summarize and report a trial series across locations and/or years; links with Trial Database to select trials based on information in any trial data entry field.

Hitachi High Technologies America, Inc. — Booth: 513

Clarksburg, MD
Website: **www.hitachi-hightech.com/us**

Hitachi High Technologies America sells and supports innovative and reliable analytical instrumentation to meet the demands of today's research labs. The TM3030 and TM3030Plus tabletop scanning electron microscopes deliver superb imaging capabilities in a compact and portable footprint, along with the FlexSEM 1000 VP-SEM, delivering the power of a full-sized SEM in a compact and separable unit. Hitachi also sells and services Atmospheric SEM and Atomic Force Microscopes.

Holly D'Oench Art — Booth: 414

Arvada, CO
Website: **www.hollydoenchart.com**

Natural history illustrations by Holly D'Oench. We sell prints of paintings that depict entomological and other natural history subjects. Original art and commissions are available.

ICE 2020 Helsinki — Booth: 516

Espoo, Uusimaa, Finland
Website: **www.ICE2020Helsinki.fi**

26th International Congress of Entomology, July 19-24, 2020, in Helsinki, Finland: Entomology for Our Planet.

Integrated Digitized Biological Collections — iDigBio — Booth: 315

Tallahassee, FL
Website: **www.idigbio.org**

Integrated Digitized Biological Collections — iDigBio is the national resource for digitized information about existing, vouchered natural history collections and as such promotes the uses of biological/paleontological collections data by the scientific community and stakeholders including government agencies, educational institutions, NGOs, and other national and international entities to benefit science and society through enhanced research, educational, and outreach activities.

ISCA Technologies — Booth: 200

Riverside, CA
Website: **www.iscatech.com**

ISCA's development of environmentally friendly, natural, and pheromone-based tools and solutions for agricultural and urban applications provide a complete solution to these traditional insecticide-related problems.

Global losses caused by pests account for approximately 30-40% of potential food, fiber, and feed production worldwide, with substantially higher losses in many developing countries. These losses are estimated to be US$300 billion annually. For a better and safer world, ISCA shares a commitment and responsibility to reduce the staggering human suffering and economic losses caused by pests.

Johns Hopkins University Press — Booth: 213

Baltimore, MD
Website: **www.press.jhu.edu**

One of the largest publishers in the United States, the Johns Hopkins University Press publishes 80 scholarly journals and nearly 200 new books each year. Award-winning lists in history, science, literary studies, political science, and medicine reach a worldwide audience of scholars, students, and discerning readers.

Laudier Histology — Booth: 500

New York, NY
Website: **www.laudierhistology.com**

Laudier Histology is a boutique histology laboratory specializing in insect and related arthropod histology services. We offer: precision specimen preparation, histopathology analysis, applied histochemical assays, and a wide range of imaging services.

Loligo Systems — Booth: 212

Visborg, Denmark
Website: **www.loligosystems.com**

Loligo Systems offer unique research equipment for measuring animal respiration and behavior. Products are automated respirometry systems for oxygen consumption measurements in a single egg, embryo, larvae, or adult animal ranging in size from a few µg and up; sensors and meters; and video tracking software for analyzing individual animal behavior even in swarms, groups, schools, or herds.

Macroscopic Solutions — Booth: 506

Tolland, CT
Website: **www.macroscopicsolutions.com**

Macroscopic Solutions provides products, services, and support that are based on the photographic technique of focus stacking. Our team is dedicated to improving the significance of focus stacking for the scientific and industrial communities by providing novel and elegant imaging solutions.

Mile High Bug Club — Booth: 207

Colorado Springs, CO
Website: **milehighbugclub.org**

The Mile High Bug Club is dedicated to education about, and conservation of, Colorado insects and other arthropods.

Monsanto — Booth: 600

Chesterfield, MO
Website: **www.monsanto.com**

Monsanto Company is a leading global provider of technology-based solutions and agricultural products that improve farm productivity and food quality. Monsanto remains focused on enabling both small-holder and large-scale farmers to produce more from their land while conserving more of our world's natural resources such as water and energy. To learn more about our business and our commitments, please visit: www.monsanto.com.

NIGHTSEA — Booth: 612

Lexington, MA
Website: **www.nightsea.com**

Fluorescence! NIGHTSEA offers tools for viewing/photographing fluorescence over a wide range of scales. Natural fluorescence, fluorescent markers, fluorescent proteins and dyes—we can help you see it all. An economical system that adapts existing stereomicroscopes for fluorescence, flashlights, and camera accessories! Come talk to us about your glowing applications.

Oxford University Press — Booth: 503

New York, NY
Website: **www.global.oup.com**

Oxford University Press is the largest university press in the world, publishing in 70 languages and 190 countries. Find out how we make the highest-quality academic and professional content available around the globe. Visit us at Booth 503 for sample copies of our journals and discounted books.

Percival Scientific Inc. — Booth: 205

Perry, IA
Website: **www.percival-scientific.com**

Percival Scientific represents a rich tradition of product ingenuity and reliability throughout the world. We provide clients with reliable custom solutions designed to meet their specific research requirements. Customers rely upon Percival to meet their unique needs by providing chambers that are engineered and manufactured to their specifications. The ability to meet individual requirements to control extensive critical testing variables has allowed our company to become an industry leader.

Every Percival chamber is designed and manufactured in America's heartland in Perry, Iowa. We take American Pride in engineering and manufacturing the best chambers used throughout the world.

Polyguard Barrier Systems — Booth: 417

Ennis, TX
Website: **www.polyguardbarriers.com**

Polyguard Barrier Systems manufactures building materials designed to physically exclude termites and other pests, without the use of pesticides.

Rad Source Technologies — Booth: 412

Suwanee, GA
Website: **www.radsource.com**

Since 1998, Rad Source has built, sold, and serviced the "Gold Standard" of self-shielded X-ray irradiators. They are direct replacements for Cs-137 and Co-60 gamma irradiators. Applications include blood irradiation (FDA-cleared), small animals, cell arrestment, sterile insect release (SIT), phytosanitary research, and viruses, among others. Minimal regulatory requirements. Easy to operate.

RAPiD Genomics — Booth: 416

Gainesville, FL
Website: **rapid-genomics.com/home**

Rose Micro Solutions — Booth: 512

West Seneca, NY
Website: **www.rosemicrosolutions.com**

Rose Micro Solutions sells high-quality optical loupes and LED lighting systems for less! Our loupes start at $279. We are a "Family Business" consisting of four brothers. We named the company after our mother, "Rose." Stop by Booth 512 to see our *new* line of TTL loupes! You'll love the optics.

Sable Systems International — Booth: 408

Las Vegas, NV
Website: **www.sablesys.com**

Sable Systems International is the widely cited, international standard in high-resolution metabolic screening and respirometry. Our systems can measure gas exchange from a drosophila to a whale in real time. Technical support is by published experts in insect respirometry. Please drop by our booth and discuss what we can do for your research.

SC Johnson & Son, Inc. — Booth: 514

Racine, WI
Website: **www.scjohnson.com**

We are SC Johnson's global research facility that is dedicated to understanding insect life and promoting positive human-insect interactions. Located in Racine, Wisconsin, we are involved in all aspects of entomology that lead to technical innovations for improving the lives of consumers. Stop by and learn more about our Research Center.

SciBugs Collections — Booth: 215

Athens, GA
Website: **www.etsy.com/shop/SciBugsCollections**

SciBugs Collections features handmade, eco-friendly jewelry using jewel beetle and butterfly wings with Ecuadorian tagua nuts. We also do custom orders!

Springer — Booth: 201

New York, NY
Website: **www.springernature.com**

Springer Nature is one of the world's leading global research, educational and professional publishers, home to an array of respected and trusted brands providing quality content through a range of innovative products and services. Springer Nature is the world's largest academic book publisher and numbers almost 13,000 staff in over 50 countries.

Taylor & Francis Group — Booth: 406

Boca Raton, FL
Website: **www.taylorandfrancis.com**

Taylor & Francis partners with world-class authors, from leading scientists and researchers, to scholars and professionals operating at the top of their fields. We are one of the world's leading publishers of scholarly journals, books, eBooks, text books and reference works. Visit our booth and view our latest publications!

The Coleopterists Society — Booth: 112

Santa Barbara, CA
Website: **www.coleopsoc.org**

The Coleopterists Society is an international organization devoted to the study of all aspects of systematics and biology of beetles of the world. Membership is open to all people who share our passion in any pursuit of knowledge and appreciation of all things beetle. The Coleopterists Society is a national 501(c)3 not-for-profit organization, organized and operated exclusively for scientific and educational purposes. Areas of interest include fostering collaboration and communication among professional and avocational Coleopterists, recognition of accomplishments of Coleopterists, and the publication of Coleoptera-related research in our refereed quarterly journal, *The Coleopterists Society Bulletin*, published continuously since 1947. Visit The Coleopterists Society's Booth and examine our latest publications—and if you are not already a member, join now!

The Lepidopterists' Society — Booth: 203

San Francisco, CA
Website: **www.lepsoc.org**

The Lepidopterists' Society is a non-profit international organization that promotes the scientific study and appreciation of Lepidoptera. The Society was founded in 1947 on the principles of uniting amateur and professional lepidopterists, and our 900 members include researchers, educators, conservationists, collectors, watchers, photographers, and students of all ages.

The Resource Shop, Inc. — Booth: 314

Palatka, FL
Website: **www.jeffmcgovern.com**

The Resource Shop, Inc., is the brainchild of Jeff and Kate McGovern. Jeff, aka The Pest Coach, is well known in the industry for his consultant work, entertaining speaking engagements, and feature articles in *PCT* and *PMP* magazines. The booth overflows with the best quality of equipment, materials, and ideas that cover all aspects of pest management, especially green and IPM programs.

Tourism Vancouver — Booth: 317

Vancouver, British Columbia
Website: **www.tourismvancouver.com**

ESA's 2018 Annual Meeting will be jointly held with the Entomological Society of Canada (ESC) and the Entomological Society of British Columbia in Vancouver, BC, November 11-14, 2018. Visit with representatives from Vancouver and learn about next year's host city. Here, representatives from the city can answer your questions about traveling to Canada, what you can bring, and documents you may need to prepare to bring insects across the border!

Tousimis — Booth: 616

Rockville, MD
Website: **www.tousimis.com**

Tousimis is a globally recognized manufacturer of highly reliable CPD systems. We are based in the Washington, DC, area with global sales and service support. We have over four decades' experience designing and fabricating our CPD systems. Our CPD process reproducibly preserves micro & Nano 3D structure. Current applications include: Biological, MEMS, Gel, Nano Particle, C-Nanotubes, Graphene, and others.

Please visit and learn about how we can benefit your entomological research!

University of Arkansas — Booth: 214

Fayetteville, AR
Website: **www.entomology.uark.edu**

The Department of Entomology at the University of Arkansas offers M.S. and Ph.D. degrees, with strengths in systematics, host-plant interactions, applied insect ecology, and other research areas. The department's display provides information on graduate study, available fellowships, and other opportunities.

University of Florida DPM and University of Nebraska DPH Programs — Booth: 204

Gainesville, FL
Website: **www.ufplantdoctors.org & dph.unl.edu**

The University of Florida Doctor of Plant Medicine Program and the University of Nebraska Doctor of Plant Health Program are similar doctoral degree programs for training high level professional plant health practitioners, or Plant Doctors. DPM students complete hands-on courses, two elective substantial internships, and several credits of required internships. The following discipline departments collaboratively support DPM students through mentoring, teaching, and committee service: Agronomy, Entomology and Nematology, Environmental Horticulture, Food Science and Human Nutrition, Horticultural Sciences, Plant Pathology, School of Forest Resources and Conservation, and Soil and Water Sciences. The DPH program at Nebraska has been fashioned after the DPM program and requires similar educational background and training.

University of Maryland Entomology Department — Booth: 614

College Park, MD
Website: **www.entomology.umd.edu**

The Entomology Department at the University of Maryland, College Park, located just outside Washington, DC, conducts research, teaching, and extension with broad training opportunities available in agricultural and urban pest management, biological control, genetics and genomics, behavior, ecology, evolution, systematics, and related fields. For more information, please visit entomology.umd.edu.

University of Maryland Insect Transformation Facility — Booth: 312

Rockville, MD
Website: **www.ibbr.umd.edu/facilities/itf**

The University of Maryland's Insect Transformation Facility specializes in genome modification of non-model insects using all currently available technologies. Services include line creation, microinjection, collaboration, training, and consultation. The facility has an established history of success and will work with researchers to ensure the success of their projects.

Virginia Tech Department of Entomology — Booth: 208

Blacksburg, VA
Website: **www.ento.vt.edu**

The Department of Entomology at Virginia Tech (VT) offers M.S. and Ph.D. degrees, with strengths in pest management in forest, agronomic, horticultural and urban systems, vector biology, vector-borne diseases, biological control, insect toxicology, and pollinator biology. Obtain information on graduate study and available fellowships, and mingle with current VT employees and alumni.

Wiley — Booth: 303

Malden, MA
Website: **www.wiley.com**

Wiley, a global company, helps people and organizations develop the skills and knowledge they need to succeed. Our online scientific, technical, medical, and scholarly journals, combined with our digital learning, assessment, and certification solutions help universities, learned societies, businesses, governments, and individuals increase the academic and professional impact of their work.

XT-2000 Orange Oil Plus — Booth: 412

Santee, CA
Website: **www.xt2000.com**

XT-2000 Orange Oil Plus is 95% pure d-Limonene, which is an active ingredient in orange oil. It's the drill and inject method for drywood termites, carpenter ants, and wood-boring beetles. Integrated Pest Management (IPM) and Generally Recognized As Safe (GRAS) product. Least toxic, low impact, and a renewable resource treatment. No tenting or move outs necessary, and pet friendly!

Sharing Insect Science Globally

ESA Awards Hall of Fame

Congratulations to this year's award winners!

Please help us recognize these outstanding individuals at the associated events listed below.

Opening Plenary Session

Sunday, November 5 • 7:30 – 9:30 PM
Four Seasons Ballroom, Convention Center

HONORARY MEMBERS

Gene Kritsky
Roger Moon
Robert N. Wiedenmann

ESA FELLOWS

Nora J. Besansky
Lincoln P. Brower
Yves Carriere
Mustapha Debboun
Michael Engel
Bernd Heinrich
Richard L. Lindroth
Sally Rockey
Guy Smagghe
Marla Spivak

Awards Breakfast

Tuesday, November 7 • 7:30 AM
Four Seasons Ballroom, Convention Center

ESA PROFESSIONAL AWARDS

Elizabeth (Betsy) Beers, Award for Excellence in Integrated Pest Management (sponsored by Syngenta Crop Protection, Inc.)

Carol Black, Distinguished Achievement Award in Extension

David Smitley, Distinguished Achievement Award in Horticultural Entomology

Wyatt Hoback, Distinguished Achievement Award in Teaching

Alvin M. Simmons, Recognition Award in Entomology

Subba Reddy Palli, Nan-Yao Su Award for Innovation and Creativity in Entomology

Mariana Federica Wolfner, Recognition Award in Insect Physiology, Biochemistry, and Toxicology (sponsored by Apex Bait Technologies, Inc.)

Brian T. Forschler, Recognition Award in Urban Entomology (sponsored by S.C. Johnson & Son, Inc.)

Michael S. Engel, Thomas Say Award

EARLY CAREER PROFESSIONAL AWARDS

Justin George, Henry & Silvia Richard Research Grant

Joshua Benoit, Early Career Innovation Award

Nancy Miorelli, Early Career Professional Outreach and Public Engagement Award

Kelly Hamby, Early Career Professional Extension Award

Daniel R. Swale, Early Career Professional Research Award

Erika Machtinger, Early Career Teaching Award

ESA CERTIFICATION AWARDS

Rebecca Baldwin, Distinguished Service Award to the Certification Program

Alan Feuer, ACE Professional Award

ENTOMOLOGICAL FOUNDATION AWARDS

Lara Guerra, President's Prizes for Outstanding Achievement in Primary Education

Gregory Bisbee, President's Prizes for Outstanding Achievement in Secondary Education

Andrine Shufran, Foundation Medal of Honor

Student Awards Ceremony

Tuesday, November 7 • 6:30 PM
Four Seasons Ballroom, Convention Center

JOHN HENRY COMSTOCK AWARDS

Flor Edith Acevedo, Eastern Branch

Chong Chin Heo, Southwestern Branch

Amelia Lindsey, Pacific Branch

Ashley Mortensen, Southeastern Branch

Kayla I. Perry, North Central Branch

Isobel Ronai, International Branch

ESA STUDENT AWARDS

John Gordy, The Larry Larson Graduate Student Award for Leadership in Applied Entomology

Isobel Ronai, Lillian & Alex Feir Graduate Student Travel Award in Insect Physiology, Biochemistry, or Molecular Biology

Alix Whitener, Student Activity Award (sponsored by Monsanto Company)

Lina Bernaola, ESA Student Certification Award (sponsored by PestWest Environmental Science)

Start your nomination packets early and nominate a colleague or peer for a 2018 ESA Award.
The deadline to nominate is June 1, 2018. For more information visit www.entsoc.org/about/awards-honors

Sharing Insect Science Globally

2017 ESA, ESA Certification Corporation, and Entomological Foundation Awards

Each year the Entomological Society of America, the ESA Certification Corporation, and the Entomological Foundation provide annual honors and awards to recognize scientists, educators, early professionals, and students who have distinguished themselves through their contributions to entomology.

For more information on the ESA, Certification Corporation, and Entomological Foundation Awards, visit www.entsoc.org/awards.

Opening Plenary: ESA Fellows, ESA Honorary Members & Entomological Foundation Medal of Honor

ESA's 2017 Honorary Members and Fellows will be presented during the Opening Plenary Session on Sunday, November 5, 7:30 – 9:30 PM, and the Awards Breakfast on Tuesday, November 7, 7:30 – 9:00 AM. Both sessions will take place in the Four Seasons Ballroom of the Convention Center.

Honorary Members

Honorary membership acknowledges those who have served ESA for at least 20 years through significant involvement in the affairs of the Society that has reached an extraordinary level. Candidates for this honor are selected by the ESA Governing Board and then voted on by the ESA membership.

Dr. Gene Kritsky, a 41-year member of the Entomological Society of America, received his B.A. in biology (1974) from Indiana University and his M.S. (1976) and Ph.D. (1977) in entomology from the University of Illinois. He joined the Biology Department at Tri-State University (now Trine University) in 1977 and was awarded a Fulbright Scholarship to Minya University in Egypt from 1981 to 1982. In 1983, he joined the biology faculty at Mount St. Joseph University, serving as chair (1985–1999 and 2011–2016), director of health sciences (1999–2002), professor (1987–present), and dean of the School of Behavioral and Natural Sciences (2017). He has served ESA as interim editor-in-chief (2002–2003) and editor-in-chief (2003–2017) of *American Entomologist*, making him the longest-serving editor-in-chief in the history of *American Entomologist* and its predecessor, *The Bulletin.* Gene has also served ESA on the Standing Committee on Public Information (1985–1986), the Membership Committee of the ESA North Central Branch (1985), and the Publications Council (2003–2017). He was a co-convener of the International Congress of Entomology (2016), co-chair of the Local Arrangements Committee for the ESA National Meeting (2003), contributing editor to *American Entomologist* (1998–2003), and chair of the Film Advisory Committee (1986). He produced an ESA public service radio series (1984) and presented the Founders' Memorial Award Lecture (2012). He is a Fellow of the American Association for the Advancement of Science and a recipient of the Indiana Academy of Science's Distinguished Scholar Award, and he has published more than 160 papers and 10 books.

Dr. Roger Moon became professor emeritus of entomology at the University of Minnesota in St. Paul after 36 years of service in research, teaching, and outreach. He earned a Ph.D. in entomology from the University of California, Davis, in 1979. His research concerns the biology, ecology, and management of filth flies, mosquitoes, bots, keds, lice, bugs, and mites that occur around livestock, wildlife, and people. Roger has published more than 130 articles, reviews, and book chapters for scientists and the general public, including papers on stable fly ecology, swine mange, and fly-borne spread of PRRS virus. He taught or co-taught courses in veterinary entomology, medical entomology, veterinary parasitology, insect population dynamics, and applied experimental design, and he has advised 15 students to master's and doctorate degrees. Roger joined the Entomological Society of America as a student member in 1976 and has attended every annual meeting since then. He served as chair of ESA's MUVE Section, its Meeting Technology Committee, its Publications Council, three of its editorial boards, and as subject editor for the *Journal of Medical Entomology* (2002–2015). Roger was a founding member of the all-entomologist band The Stridulators and has been active since retirement as a bass guitarist in several geezer cover bands playing in the Twin Cities area.

Dr. Robert N. Wiedenmann is a professor in the Department of Entomology at the University of Arkansas. He received a B.S. in ecology and evolutionary biology (1985) and Ph.D. in entomology (1990), both from Purdue University. After a postdoctoral position in the biological control labs at Texas A&M University, he worked for more than a decade at the Illinois Natural History Survey. In 2005, he became head of the Department of Entomology at Arkansas, serving until 2014, when he stepped down to return to the faculty. He currently teaches the large-enrollment class "Insects, Science, and Society" and a hybrid live-distance class, "Advanced Applied Entomology," taught collaboratively with the University of Kentucky and Kansas State University. He has been a member of the Entomological Society of America since 1985 and has served ESA in many capacities, including program chair (2003) and

president (2004) of the North Central Branch; president of the Plant-Insect Ecosystems Section (2008); local arrangements chair for the Southeastern Branch meeting (2012); and ESA president (2013). Highlights of his service include leading the efforts to develop a Science Policy Initiative, placing ESA in the policy arena, and increasing the Society's visibility. He also redirected and strengthened the Student Transition and Early Professional Committee (now Early Career Professionals Committee) and furthered the Society's efforts at globalization and diversity. He led the effort to hold the first joint branch meeting, uniting the Southeastern and Southwestern Branches (2012). He has conducted research and outreach on biological control of insects and weeds and has been a critic of the potential invasiveness of bioenergy crops.

Fellows

The designation of ESA Fellow recognizes individuals who have made outstanding contributions to entomology.

Dr. Nora J. Besansky, O'Hara Professor of Biology at the University of Notre Dame (UND), was elected as Fellow in 2017. She is internationally known for her research on the genetics and evolution of anopheline mosquito vectors of malaria.

Dr. Besansky was born in 1960 in Washington, DC, and grew up in the Maryland suburbs (Silver Spring). Her first paid job was as an intern at the newly minted Smithsonian Insect Zoo (1977), followed by summers working as a technician at the Beltsville Agricultural Research Center and the Malaria Section of the Laboratory of Parasitic Diseases at the National Institutes of Health (NIH), where her love of malaria vectors was first cultivated. She earned a B.A. in biology from Oberlin College in 1982 and a Ph.D. in genetics from Yale University in 1990. After a short postdoctoral fellowship at the Centers for Disease Control and Prevention (CDC) in retroviral diseases, she became a staff scientist with the CDC Malaria Branch from 1991 until 1997, when she joined the University of Notre Dame (UND) as an associate professor of biology, rising to professor in 2002. She was appointed O'Hara professor in 2010, has served as associate chair of biology since 2015, and has been affiliated with the UND Eck Institute for Global Health since its inception.

Dr. Besansky's research has been motivated by an interest in understanding why the dominant vectors of malaria nearly always belong to "species complexes" whose closely related members are often morphologically identical, yet differ enough physiologically and behaviorally to contain both non-vector and vector species. Her research on the *Anopheles gambiae* complex led to a resolution of the historical branching order of its species—a longstanding controversy—and a recognition of the genome-wide extent of introgression between two of its principal malaria vectors. Recently her research group has begun to explore similar issues in the less well-known but medically important *An. funestus* complex. Other projects include understanding the role of chromosomal inversions in local adaptation, and the genetic basis of ongoing ecological speciation within malaria vectors. Supported by the NIH, the Bill & Melinda Gates Foundation, and the World Health Organization, her research has resulted in more than 130 scientific publications.

Dr. Besansky led a large international consortium that sequenced and analyzed the genomes of 16 *Anopheles* species, and she remains active in generating and improving genomic resources for the scientific community. She serves as associate editor for *PLoS Pathogens* and sits on several editorial boards, including *Current Opinion in Insect Science*. She served as member (and chair) of the NIH Vector Biology Study Section. Dr. Besansky teaches undergraduate and graduate courses at UND and has advised 29 graduate students and postdoctoral fellows as well as 31 undergraduate researchers. Dr. Besansky has also been elected Fellow of the American Association for the Advancement of Science (2005), the American Society for Tropical Medicine and Hygiene (2014), and the Royal Entomological Society (2016).

Married to fellow medical entomologist Frank Collins for more than 30 years, they are the parents of two sons and the devoted subjects of two cats.

Dr. Lincoln P. Brower, research professor of biology at Sweet Briar College and distinguished service professor of zoology emeritus at the University of Florida, was elected as Fellow in 2017. He is internationally known for his research on the chemical and physiological ecology and conservation of the monarch butterfly.

Professor Brower was born in New Jersey in 1931. He received a B.S. in biology from Princeton University in 1953 and a Ph.D. in zoology from Yale University in 1957, working with Dr. Charles Remington. A Fulbright

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Fellowship allowed him to spend 1957 and 1958 in Dr. E.B. Ford's Ecological Genetics Lab at Oxford University before joining the Biology Department at Amherst College, where he rose from instructor to the Stone Professor of Biology. In 1980, he moved to the University of Florida, as professor of zoology from 1980 to 1995 and distinguished service professor from 1995 until his retirement in 1997. Sweet Briar College, a liberal arts college in Virginia, appointed him as research professor of biology.

In total, Dr. Brower has authored and coauthored more than 200 scientific papers, edited two books, and produced eight films. His early research on insect adaptive coloration led to collaborations with chemists and ecologists in exploring the chemical ecology of milkweeds, monarch butterflies, and bird predators. His photographs of a blue jay vomiting after eating a monarch butterfly are classic. When the winter location of eastern monarch butterflies was announced in 1976, Brower's research pivoted to studying the extraordinary winter colonies in Mexico and to the microclimatic protection provided by the forests. On his first visit in January 1977, Brower recognized that the colonies could be lost to deforestation, and his work expanded to include conservation of this endangered phenomenon. He conducted field and laboratory research to understand the butterflies' habitat requirements, worked with conservation organizations and government agencies to design the monarch butterfly reserves, and encouraged the public to care about monarchs through innumerable public lectures and consulting for dozens of articles, books, and documentaries. In 2015, Dr. Brower was a signatory on the petition to the U.S. Fish & Wildlife Service to designate the monarch butterfly as a threatened species.

Dr. Brower's awards include the E.O. Wilson Award of the Center for Biological Diversity, Reconocimiento a la Conservación de la Naturaleza from the Mexican federal government, Marsh Award of the Royal Entomological Society, Wilbur Lucius Cross Medal from Yale, Henry Bates Award of the Association for Tropical Lepidoptera, Distinguished Animal Behaviorist Award of the Animal Behavior Society, and the Linnaean Medal for Zoology. He is a Fellow of the Royal Entomological Society and Explorers Club, Honorary Life Member of the Lepidopterists' Society, and research associate of the Smithsonian Institution and the McGuire Center for Lepidoptera at the University of Florida.

Dr. Brower and his wife, Professor Linda Fink, share their home in Virginia's Blue Ridge Mountains with three German shepherds and two cats. A conservation easement protects rich deciduous forest and abundant wildlife, including many charismatic insects, on their mountain land.

Dr. Yves Carrière is a professor in the Department of Entomology at the University of Arizona. He is internationally known for his research in applied insect ecology, especially ecological aspects of insect resistance to insecticides and transgenic plants, and development of landscape-based pest management programs.

Professor Carrière was born in Montréal, Canada, in 1958. He earned a B.Sc. in biology and M.Sc. in entomology with Dr. Jeremy McNeil at Laval University in Quebec. He obtained his Ph.D. in 1991 at Simon Fraser University with Dr. Bernie Roitberg, studying the evolution of insect-plant interactions. He subsequently was a postdoctoral fellow with Dr. Derek Roff at McGill University, working on the evolution of insect life histories and resistance to insecticides. He then worked as an adjunct professor on the development of integrated pest management programs for turf grass insects with Dr. Jacques Brodeur at Laval University before taking his current position at the University of Arizona in 1998.

Dr. Carrière has studied numerous aspects of the interactions between insects and transgenic Bt crops. These include the regional impact of deployment of Bt crops on pest population dynamics, the impact of fitness costs on the evolution of resistance, and the association between similarity of Bt toxins and factors that affect evolution of resistance to pyramided Bt crops. He has also pioneered spatially explicit, large-scale analyses of pest population dynamics, spread of insect-transmitted viruses, patterns of evolution of resistance, and other factors related to management of resistance to Bt crops. Dr. Carrière has produced more than 190 scientific publications, including a book, 12 book chapters, and 140 peer-reviewed journal articles. His grants from the U.S. Department of Agriculture, the Environmental Protection Agency, the National Institutes of Health, the Bill & Melinda Gates Foundation, industry, and other sources total more than $12.6 million.

Dr. Carrière has enjoyed mentoring 39 graduate students, 12 as major supervisor and 27 as a committee member. He also mentored seven postdoctoral scientists and hosted five visiting scientists. He is involved in science outreach to the public and shares his interests in insects and cooking with thousands of visitors at the Insects as Food booth at the annual Arizona Insect Festival.

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Recognition of Dr. Carrière's achievements includes selection as a Fellow of the American Association for the Advancement of Science (2012); Distinguished Alumnus, Simon Fraser University (2012); and Research Faculty of the Year, College of Agriculture & Life Sciences, University of Arizona (2013). He was chosen to serve on the National Academy of Sciences/National Research Council committee evaluating the impact of genetically engineered crops on farm sustainability in the United States (2009-2010).

Dr. Carrière was a professional skier for several years before attending university and still enjoys skiing in the White Mountains of Arizona. He lives with his wife, entomologist Kathleen Walker, and their son and daughter in Tucson.

Dr. Mustapha Debboun is a medical and veterinary entomologist. He was born in Tangier, Morocco, and received a B.A. in cellular and molecular biology from Skidmore College in Saratoga Springs, New York; an M.S. in medical entomology from the University of New Hampshire in Durham, New Hampshire; and a Ph.D. in medical and veterinary entomology from the University of Missouri-Columbia.

Dr. Debboun is currently serving as the Director of the Mosquito & Vector Control Division at Harris County Public Health in Houston, Texas. He has worked in global military public health entomology, vector-borne diseases, preventive medicine operations, research and development of arthropod repellents, and field personal protective measures. This work has taken him to more than 35 different countries in Africa, Asia, Australia, Europe, and Latin and South America. His main goal is the integration of medical and veterinary entomology with other academic and operational public health fields to provide efficient and sustainable management of disease vectors and human protection from the vector-borne disease threat.

Dr. Debboun has served with distinction in the U.S. Army in various military assignments and leadership positions as executive officer, 714th Medical Detachment; preventive medicine instructor, Academy of Health Sciences; commander, 255th Medical Detachment, Headquarters, Department of the Army; medical research technology staff officer at the Pentagon; program research manager at Walter Reed Army Institute of Research; theater medical entomologist during Operations Enduring Freedom and Iraqi Freedom; commander, U.S. Army Center for Health Promotion & Preventive Medicine-South at Fort McPherson; and chief, Medical Zoology Branch, and chief, Department of Preventive Health Services, at the Army Medical Department Center & School.

Dr. Debboun is a board-certified medical and veterinary entomologist, a U.S. Department of Defense liaison to the Scientific Review Committee and special advisor to the Scientific Council of the International Committee of Military Medicine, and a member of six scientific associations. Dr. Debboun has authored or co-authored more than 105 peer-reviewed scientific publications and a book titled *Prevention of Bug Bites, Stings, and Disease* and co-edited two other books: *Insect Repellents: Principles, Methods, and Uses* and *Insect Repellents Handbook*. He also organizes and leads national and international public health entomology symposia, participates as a subject matter expert scientific reviewer and editorial review board member of eight scientific journals, and serves as vice chair of the Entomological Society of America Medical, Urban, and Vector Entomology Section. Dr. Debboun is nationally and internationally recognized for his work on global military and civilian public health entomology and on personal protective measures against disease vectors and arthropod repellent research and development.

Dr. Debboun's military and civilian awards include the Legion of Merit, two Bronze Star medals, six Meritorious Service medals, Military Outstanding Volunteer Service medal, Order of Military Medical Merit, U.S. Army Surgeon General's "A" Professional Proficiency Designator for excellence and expertise in medical and veterinary entomology, Distinguished Service Award to the Certification Program of the Entomological Society of America, and U.S. Department of Agriculture Outstanding Agricultural Service Award.

Dr. Debboun is married to his wife, Natalie, and they are parents of a daughter, Ameena, and two sons, Adam and David.

Dr. Michael S. Engel, a professor in the Department of Ecology & Evolutionary Biology and senior curator in the Division of Entomology at the University of Kansas, Lawrence, was elected as Fellow in 2017. He is internationally known for his research on insect systematics and paleontology, and as a prolific writer, with more than 675 articles and books, including co-authoring with Dr. David A. Grimaldi the influential tome *Evolution of the Insects* (2005).

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Professor Engel was born in Missouri in 1971 but lived there for only 10 months before his family relocated to the West Coast. In 1989, he matriculated at the University of Kansas, receiving his B.S. in physiology and cell biology and B.A. in chemistry in 1993, and then promptly entered the doctoral program in entomology at Cornell University, graduating with his Ph.D. in May 1998. After graduation, he was appointed as a research scientist in the Department of Entomology at the American Museum of Natural History in New York, remaining there until August 2000. In 2000, he returned to the University of Kansas, becoming assistant professor in the Department of Entomology and Department of Ecology & Evolutionary Biology and assistant curator in the KU Natural History Museum's Division of Entomology, assuming the position formerly occupied by his mentor, Professor Charles D. Michener. He was subsequently promoted to associate professor and associate curator in 2005 and to full professor and senior curator in 2008. Dr. Engel founded the *Journal of Melittology* in 2013, a peer-reviewed serial for the study of non-*Apis* bees, and has served as editor, assistant editor, or editorial board member for numerous other journals, including *Systematic Entomology*, *Arthropod Systematics and Phylogeny*, *Entomologist's Monthly Magazine*, *ZooKeys*, *Journal of Paleontology*, and *Cretaceous Research*.

During his career, Dr. Engel's research has contributed to an understanding of the geological history, phylogenetic relationships, past and present diversity, and evolution of many insect lineages, as well as those of Entognatha, Crustacea, Arachnida, and Onychophora. His studies have made possible revised classifications and evolutionary histories of termites, zorapterans, lacewings, and bees, as well as syntheses on the origin of major features in insect evolution, most notably wings and flight. Aside from his paleontological endeavors, Dr. Engel has contributed to the systematics and biology of bees, most recently working on the fauna of the Arabian Peninsula.

Dr. Engel received a Guggenheim Fellowship in 2006 and was previously elected a Fellow of the Linnean Society of London (2000) as well as of the Paleontological Society (2008). He received a 2006 William T. Kemper Fellowship in recognition of contributions to graduate education, as well as the 2008 Charles Schuchert Award of the Paleontological Society, 2009 Bicentenary Medal of the Linnean Society of London, 2014 University Scholarly Achievement Award of the University of Kansas, and a 2015 International Cooperation Award from the Chinese Academy of Sciences.

Dr. Engel presently lives in Lawrence with his wife, Kellie, and enjoys time with his nephews and nieces, classical music, and readings in philology, comparative mythology, and history.

Dr. Bernd Heinrich, emeritus professor of biology at the University of Vermont and formerly professor of entomology at the University of California (UC), Berkeley, was elected Fellow in 2017. He is internationally known for his work in insect physiology and behavior and extending this work to ecology and evolution of vertebrates, especially ravens.

Dr. Heinrich was born in 1940, and from 1945 to 1950 his family lived isolated in a forest in northern Germany. There he came under the influence of his father, Gerd H. Heinrich, an international explorer and noted Ichneumon taxonomist. The family emigrated to the U.S. and he grew up in rural Maine. He received both his B.A. and M.S. from the University of Maine, Orono. He earned his Ph.D. from University of California, Los Angeles, in 1970, immediately after which he joined the entomology faculty at UC, Berkeley, and attained the rank of professor of entomology in 1976. He returned to his New England roots in 1980, taking a position at the University of Vermont.

Dr. Heinrich has been interested in insects since early childhood, starting with ichneumon- and caterpillar-hunting and a collection of carabid beetles at age eight. He has expanded his interests to numerous aspects of biology. His research career started with protozoan cell biology, leading to comparative physiology and behavior of moths, then butterflies, bumble bees, honey bees, vespid wasps, dung beetles, dragonflies, sexton beetles, caterpillars, and dipteran larvae. His major discovery was thermoregulation of sphinx moths in flight by a previously unknown mechanism in insects, which led to his continuing work in body temperature control and elucidating a new mechanism for social temperature control in honey bees. The physiology and behavior opened continued work on bumble bee foraging energetics with application to relations of the pollen vectors to the evolution of flower diversity at the ecological level. Subsequently, he contrasted aspects of the social biology of bees to that of ravens in their enigmatic sharing behavior evolved from competition for prized food resources.

Dr. Heinrich is a prodigious author with 128 refereed publications, with the most papers in the *Journal of Experimental Biology* (18), *Animal Behaviour* (nine),

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and *Science* (eight). He has written 20 books, 51 book chapters, and 93 popular science writings in magazines such as *Audubon*, *Natural History*, and *Scientific American*. His book *Bumblebee Economics* was a National Book Award in Science finalist. In addition to insects, he has published extensively on ornithology, including *Ravens in Winter* and *Mind of the Raven*, which won the John Burroughs Medal for Nature Writing. His *Winter World: The Ingenuity of Animal Survival* was a *New York Times* Bestseller.

Now living with his partner, Lynn, in a self-made cabin in the Maine woodland property near his original boyhood home, he continues his active interests in entomology and ornithology with field research and writing. He has four children and three grandchildren.

Dr. Richard Lindroth, Vilas Distinguished Achievement and Sorenson Professor in the Department of Entomology at the University of Wisconsin (UW)—Madison, was elected Fellow in 2017. He is an international leader in the disciplines of chemical ecology, plant-insect interactions, and global change ecology. He has also provided leadership in university administration, having served as associate dean for research and associate director of the Agricultural Experiment Station in the College of Agricultural and Life Sciences at UW—Madison.

Dr. Lindroth was born in Batavia, Illinois, in 1954. As a "free range" kid, his love of biology was nurtured while roaming the fields, forests, and ponds of land that later became home to the Fermi National Accelerator Laboratory. He received his B.S. in wildlife biology at Iowa State University (1977) and his Ph.D. in ecology (under George Batzli) at the University of Illinois at UrbanaChampaign (1984). In 1985, he received a National Science Foundation (NSF) postdoctoral fellowship to work with Dr. Mike Scriber at UW—Madison, where a focus on swallowtail-plant interactions provided an exciting on-ramp to the world of entomology. Dr. Lindroth joined the faculty of the Department of Entomology, UW—Madison, as an assistant professor in 1988 and was promoted to associate professor in 1992 and to full professor in 1996. He served as associate dean for research and associate director of the Agricultural Experiment Station from 2010 to 2016.

Dr. Lindroth's research program has been very broad, addressing the roles of mechanisms that underlie ecological interactions at levels spanning the range from biochemistry to ecosystems. His group has investigated how plant chemistry influences interactions between plants and insect herbivores and consequences thereof for community organization and ecosystem function. A major emphasis of their work has been the effects of global environmental change on plant-insect interactions in forest ecosystems. Dr. Lindroth has published more than 200 journal articles and book chapters and mentored 24 graduate students and 20 postdoctoral scientists. His research program has been supported by numerous grants from the NSF, U.S. Department of Agriculture (USDA), and the U.S. Department of Energy.

Dr. Lindroth has served on the editorial boards of four journals and on grant review panels for the NSF and USDA. He is recipient of a Fulbright Senior Scholar Award, the Silverstein-Simeone Award in Chemical Ecology, and numerous UW—Madison awards for research excellence. He is an elected Fellow of the American Association for the Advancement of Science and the Ecological Society of America.

Dr. Lindroth has been married for nearly 40 years to his wife, Nancy, with whom he parented two extraordinary daughters and now enjoys two grandsons. When not working, he explores and speaks on topics at the interface of science and religion and pursues outdoor activities abetted by carbon-fiber technology: cycling, fly fishing, and canoeing.

Dr. Sally Rockey, executive director of the Foundation for Food and Agriculture Research, is internationally known as the face of federal research administration in agriculture and biomedicine and for transforming government programs, allowing innovation to flourish in the U.S. research enterprise.

Dr. Rockey was born in 1958 in Cleveland, Ohio. She was enamored with biology from an early age and particularly loved animals, which led her to pursue zoology at The Ohio State University where she received her B.S. in 1980. Having been struck by the curious nature of insects, she went on to receive M.S. and Ph.D. degrees in entomology from The Ohio State University and did postgraduate work at University of Wisconsin prior to joining the government in 1986. Her first position was to oversee entomology programs at the U.S. Department of Agriculture (USDA) Cooperative State Research, Education, and Extension Service. From there she moved up within the organization to lead the competitive research program. In her final years with USDA she was the Chief Information Officer, applying her breadth of government knowledge to

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IT. From there she moved to the National Institutes of Health (NIH). As deputy director for extramural research at NIH, Rockey oversaw the operations of the largest extramural research program in the world. There she led groundbreaking initiatives on scientific workforce, administrative burden reduction, and electronic government. NIH was where she started her renowned "RockTalk" blog, which served as a model for government communication and opened the door to what was often considered a mystery, the NIH decision making process. In 2015, Dr. Rockey was selected to become the first executive director of the Foundation for Food and Agriculture Research, a nonprofit organization established through bipartisan support in the 2014 Farm Bill. Dr. Rockey was a natural fit for the position due to her extensive background in research administration and unique depth and breadth of knowledge of the connection between agriculture and health.

As a principal leader for research administration in the government, Dr. Rockey headed numerous federal committees such as the Research Business Models Working Group of the National Science and Technology Council's Committee on Science. She served as vice president of the Human Frontiers of Science program, an international life-science grant program that funded multinational teams of scientists conducting groundbreaking research. Throughout her career, she has participated in hundreds of agency or government-wide activities on research policy and programs, been a frequent keynote speaker, and given more than 1,000 invited presentations. In her current role, Dr. Rockey gave the prestigious Heuermann Lecture at the University of Nebraska—Lincoln and was the featured speaker at the annual awards ceremony for the Golden Goose Award, which recognizes the tremendous human and economic benefits of research. As a manager of very large staffs, she has mentored numerous employees, many of whom have followed her into research leadership positions.

Dr. Rockey has been recognized for her numerous professional accomplishments, with the Presidential Rank Award for excellence in government leadership, the Joseph F. Carrabino Award for promoting government university relationships, and the Association of Independent Research Institutions Public Service Award, among other recognitions.

Dr. Rockey is an avid reader, bridge player, and Bruce Springsteen fan. Her husband, Sam Stribling, also an entomologist, shares her love of travel, and they often visit their son, James Stribling, an artist in Savannah, Georgia.

Dr. Guy Smagghe, professor at the Department of Crop Protection at Ghent University in Belgium, was elected as Fellow in 2017. He is internationally known for his work with insects important in agriculture, devoting his career to advancing modern agriculture, sustainability, and innovations in crop protection and pollination.

Dr. Smagghe was born in 1968 in Belgium, admiring insects and their metamorphosis already as a child. He received an M.S. in agronomy and crop protection in 1991 and his Ph.D. in 1995 at Ghent University. He held different pre- and postdoctoral grants and was a visiting postdoc in Spain, Switzerland, and the United States. He was appointed as research professor in 2002 and became full professor in 2012. His multidisciplinary team has a special emphasis on insect physiology, molecular biology, applied ecology, and mechanisms underlying the evolutionary success of insects against the plethora of biotic and abiotic challenges in the environment, all with the aim for an environment-friendly control of pest insects. Several model and pest insects have been used, including caterpillars, beetles, aphids, leafhoppers, and thrips. He also has an eye for pollinators, bumble bees, and wild bees and their pollination for better production in agriculture to feed an increasing world population. Dr. Smagghe also takes responsibility in government with respect to plant protection products and biopesticides as a member of the Belgian Superior Health Council. At Ghent University, he is responsible for courses in themes of entomology, animal physiology, and novel biopesticides.

He has 25 years' experience in basic and applied research into investigating the toxicology and mode of action of new insecticidal compounds and tactics in pest control. He played a pioneering role in comparative endocrinology with insect molting hormones and ecdysteroid mimetics. Meanwhile, he is also an expert in setting up and developing different insect and receptor assays. With bumble bees and wild bees, he had a true pioneering position and is playing a forefront role in Belgium, Europe, and the world.

Dr. Smagghe has published more than 550 papers and 28 book chapters and presented more than 750 oral and poster contributions. Since 2002, more than 100 students have obtained their M.S. under his tutorship, and he has been supervisor or co-supervisor of 42 successful Ph.D. theses. He invests much in the training of young talent of the world.

Dr. Smagghe is very active in the community as editor of 18 international journals, including *Pest Management*

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Science, *Journal of Insect Physiology*, and *Pesticide Biochemistry & Physiology*. He has organized conferences in Europe, the U.S., Brazil, China, and Africa. At the Entomological Society of America, he is a Publications Committee member. With his contributions on primary and continuous insect cell cultures, he was elected in 2007 as Fellow of the Society on In Vitro Biology and in 2016 as Distinguished Scientist. He was awarded the First Prize of the Belgian Royal Academy of Science, Letters, and Fine Arts in 1998 and elected Fellow of the American Association for the Advancement of Science in 2012, and he has received three honorary doctorate degrees (2011, 2014, and 2015).

Married to his wife, Betty, for 25 years, they are the parents of three children.

Dr. Marla Spivak, Distinguished McKnight Professor in the Department of Entomology at the University of Minnesota, was elected as Fellow in 2017. She is internationally known for her research on honey bee social immunity and for her extension efforts on bee breeding for colony health and productivity.

Dr. Spivak was born in Denver, Colorado, in 1955. She began keeping bees when she was 18 years old, working for a commercial beekeeper in New Mexico. She received a B.A. in biology from Humboldt State University in northern California in 1978. She then traveled through South America, settling in Peru for some time before entering graduate school. She obtained her Ph.D. in entomology at the University of Kansas with Dr. Orley (Chip) Taylor in 1989 on the ecology and identification of Africanized honey bees in Costa Rica. From 1989 to 1991 she was a postdoctoral research associate at the Center for Insect Science at the University of Arizona and the U.S. Department of Agriculture—Agricultural Research Service Bee Research Laboratory in Tucson, working with Dr. Gloria Degrandi-Hoffman and Dr. Martha Gilliam. She was hired in the Entomology Department at the University of Minnesota in 1992 on a non-tenure track appointment. In 1993, the position was converted to tenure track and she was hired as assistant professor in entomology; she was promoted to associate professor with tenure in 1999 and full professor in 2006.

Dr. Spivak became interested in honey bee behavioral mechanisms of disease and parasite resistance (social immunity) in 1991 when she conducted studies on hygienic behavior with Dr. Gilliam. She demonstrated, in 1996, that hygienic colonies detect and remove pupae infested with the parasitic mite *Varroa destructor*, limiting parasite transmission. She bred the MN Hygienic line and used it to explore the neuroethological mechanisms of the trait and to test the performance and parasite resistance of hygienic colonies in commercial beekeeping apiaries. In 2009, she began researching the benefits of propolis (tree resins) to bees' immune function and pathogen defense. Other studies by students in her lab include the development of the first honey bee cell line, investigations on the effects of agricultural landscapes and pesticides on honey bee and native bee health, decoding the dance language to determine floral preferences of honey bees, and the creation of flowering "bee lawns" to support all bees. In 2011 she started the Bee Squad extension and education program within her lab, now run by Dr. Rebecca Masterman, for urban beekeepers and businesses. She also helped start the Tech Transfer Team program through the Bee Informed Partnership Inc. to help migratory beekeepers reduce colony losses.

Dr. Spivak was awarded a MacArthur Fellowship in 2010. Recent awards include the 2015 Minnesota AgriGrowth Distinguished Service Award, the 2016 Siehl Prize laureate for excellence in agriculture, and the 2016 Wings WorldQuest Women of Discovery Earth Award. Her 2013 TED talk has had more than 2.4 million views.

She is married to Chris Carlson. Her son, Dr. Bryan Alvarez, teaches music in Oakland middle schools.

Opening Plenary: ESA Fellows, ESA Honorary Members & Entomological Foundation Medal of Honor

Entomological Foundation Medal of Honor

The Entomological Foundation Medal of Honor was established in 2007 and is the highest award presented by the Foundation. It is given only to those who have made outstanding contributions toward fulfillment of the Foundation's mission or entomological outreach.

Since 2003, **Dr. Andrine Shufran** has been coordinator of the Oklahoma State University (OSU) Insect Adventure entomology education program and facility, and in 2008 she became an associate specialist for youth within the Oklahoma Cooperative Extension Service. This educational program travels far and wide, giving approximately 550 individual presentations and trainings on entomology and entomologically related topics annually. These presentations include professional ag development, classroom visits, community events, summer camps, insect collection trainings, 4-H projects, scouting badges, and open public hours. Topics include pollination, venomous arthropods, entomophagy, decomposers, insect art, and the ever-popular live petting zoo. To fulfill these presentations, Dr. Shufran maintains the OSU Insect Adventure facility, which houses 75 species of live arthropods. Dr. Shufran has been involved with the Entomological Foundation since 2010, serving on the Boards of Directors and Counselors. She has three degrees from institutions within the Southwestern Branch of the ESA: a B.S. from Texas A&M University, an M.S. from New Mexico State University, and a Ph.D. from OSU. She has been coordinating insect expositions since 1999 and crowned this achievement with an event for 3,500 at the International Congress of Entomology in 2016. Dr. Shufran teaches two undergraduate courses at OSU: Entomology for Educators and Internship in Teaching and Outreach, which provide opportunities to use arthropods for development of teaching and public-speaking skills. She loves her job because each day is a new and dynamic experience. Off-campus, Dr. Shufran enjoys gardening, reading, skeet, and time with her husband and two dogs. With thousands of arthropods to care for daily, she does not keep any as pets.

Awards Breakfast: ESA Professional Awards, ECP Awards, Certification Awards, and Foundation Awards

The winners of the ESA Professional, Certification Corporation, and Entomological Foundation Awards will be honored during our first Awards Breakfast starting at 7:30 AM on Tuesday, November 7, in the Four Seasons Ballroom of the Convention Center. In addition, Carol Anelli will deliver the Founders' Memorial Lecture honoring Anna Botsford Comstock.

A hot buffet breakfast will be served. Tickets are required for this event:
$5 Student Members | $7.50 Early-Career Members | $10 Members | $20 Non-Members

ESA Professional Awards

Award for Excellence in Integrated Pest Management

This award, which is sponsored by Syngenta Crop Protection, recognizes outstanding contributions that have a direct relation to Integrated Pest Management (IPM).

Dr. Elizabeth (Betsy) Beers is a professor of entomology at Washington State University, located at the Tree Fruit Research & Extension Center in Wenatchee, Washington. She earned her Ph.D. in entomology at Penn State under the direction of Dr. Larry Hull. Dr. Beers' program has covered various aspects of tree fruit research and extension for the past 32 years at the heart of one of the largest and most innovative tree fruit industries in the nation.

Her research and outreach program during this time had adapted to the needs of the industry, and although the target pest has changed over time, the approach has always worked toward a broad-based IPM program. Early work focused on secondary pests, where the opportunity for partial or complete biological control is the greatest. Pests included aphids, leafhoppers, and leafminers, some of which were reduced to non-pest status. A career-long area of interest is conservation biological control of spider mites, a successful program started in the 1960s by colleague and mentor Dr. Stan Hoyt. This program continues today by examining the nontarget effects of a new suite of pesticides, with recent work on how the phytoseiid complex has responded to those changes. The most recent projects have focused on two invasive species that threaten Washington's tree crops, spotted wing drosophila and brown marmorated stink bug. The ongoing challenge is to find management solutions that are not disruptive to existing IPM programs by reducing the nontarget effects of pesticides and increasing the number of control tactics available.

Distinguished Achievement Award in Extension

This annual award recognizes outstanding contributions to extension entomology.

Carol Black, pesticide education specialist at Washington State University (WSU), directs the Urban IPM and Pesticide Safety Education Program (PSEP). She received her B.S. (agricultural biology and pest management) from New Mexico State University and an M.S. (forest insect ecology) from WSU. Carol is a strong proponent of teamwork and feels that her program's success is due to the contributions of her staff, WSU colleagues, networks, and coalitions.

Her self-supported program is a national model for self-sustained extension programming. PSEP serves a wide array of clientele: farmers, foresters, public health professionals, aerial applicators, pest management professionals, and landscape managers, to name a few. They all need to be well-versed in the fundamentals of pesticide laws, product labeling, personal safety, resistance management, and environmental protection (including pollinators, beneficial insects, surface and groundwater, and more), which ensures continued access to efficacious pesticides important to public health, landscape, and agricultural communities. Annually, PSEP reaches over 4,500 professional applicators/growers through pesticide recertification and pre-license training courses across Washington State. PSEP offers 70 training days in 39 cities as well as one aerial applicator fly-in. Carol pioneered online training and still "hits the road" to conduct face-to-face training.

She manages EPA's Pesticide Regulatory Education Program, which provides professional development to state, territory, and tribal program managers and senior scientists. Carol helped found the National Stakeholder Team for Pesticide Safety Education Program Funding and developed much of the baseline data and reports. Her national and international work on pesticide spray drift and personal protective equipment has resulted in changes to national policy.

Awards Breakfast: ESA Professional Awards, ECP Awards, Certification Awards, and Foundation Awards

Distinguished Achievement Award in Horticultural Entomology

This award honors any entomologist who has contributed to the American horticulture industry.

Dr. David Smitley is a full professor and Michigan State University (MSU) extension specialist working closely with the turfgrass, nursery, landscape, and floriculture industries to identify and solve insect pest problems. In 1991, Dr. Smitley worked with Forest Service colleagues to introduce *Entomophaga maimaiga*, a natural fungal pathogen of gypsy moth, into Michigan, precipitating a widespread collapse of gypsy moth throughout the state over the next eight years.

In 1999, Dr. Smitley introduced a pathogen of Japanese beetle, *Ovavesicula popilliae*, into Michigan and followed the establishment and impact at eight locations over a 15-year period. Results indicate a high correlation between the build-up of *O. popilliae* and a 75% decline in Japanese beetle populations during the 15-year study period.

In the last 16 years, he worked extensively with Arborjet Inc. on the initial development and testing of the most widely used treatment to protect trees from emerald ash borer; trunk injection with emamectin benzoate (TREEäge). During the same time period, a series of field trials led to publications that explain how imidacloprid can provide a consistently high level of protection against emerald ash borer when applied as a basal soil drench. This gives homeowners a much-needed tool to protect urban trees using products available at local garden centers.

In 2014, Dr. Smitley began work with nursery and greenhouse growers to develop practices for producing high-quality plants that are safe for pollinators. This led to a joint effort with Steve Frank in 2016 to organize the first national conference on "Protecting Pollinators in Ornamental Landscapes." Stimulated by the conference, Dr. Smitley led a team of entomologists to publish "Protecting and Enhancing Pollinators in Urban Landscapes." In its first year of publication (2016), this bulletin was accessed more than any other MSU Extension publication, with 9,000+ page views and 5,200+ downloads.

Distinguished Achievement Award in Teaching

This award is presented annually to the member of the Society deemed to be the most outstanding teacher of the year.

Dr. Wyatt Hoback, assistant professor of entomology at Oklahoma State University (OSU), has been teaching undergraduate and graduate entomology courses for 18 years. He received his Ph.D. degree in entomology from the University of Nebraska—Lincoln and an M.S. in biology from Missouri State University. He taught traditional and online classes in entomology and biology for 15 years in the University of Nebraska system. At OSU, he teaches a non-majors course titled "Insects and Society" to more than 700 students each year. He wrote an online textbook for the course and engages students with a variety of projects that allow them to see the critical roles that insects have played in human history and how insects affect modern food production, health, and the environment. In addition, Dr. Hoback teaches two or three majors courses and associated laboratories each semester, including Insect Biology and Classification, Forensic Entomology, Aquatic Entomology, and Introduction to Research. He engages undergraduate and graduate students in research ranging from plant-insect interactions to conservation biology of the endangered American burying beetle. These efforts have led to the publication of 120 refereed research papers. He has also authored 11 refereed teaching articles that share laboratory exercises and approaches that he and his students have developed. Dr. Hoback has been lead P.I. on two Higher Education Challenge grants and, most recently, on a Multicultural Scholars Program grant to recruit Native American students to complete B.S. degrees in entomology at OSU.

Recognition Award in Entomology

This award recognizes entomologists who are making significant contributions to agriculture.

Dr. Alvin M. Simmons is a research entomologist with the USDA-ARS U.S. Vegetable Laboratory in Charleston, South Carolina, and is the 2017 recipient of the ESA Recognition Award in Entomology. Alvin had copious amounts of entomological ventures while growing up on his parents' farm in eastern North Carolina. Alvin received a B.S. in biology (East Carolina University), and his M.S. and Ph.D. degrees in entomology (University of Kentucky). Alvin conducts

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research on sustainable approaches for pest management in specialty crops, and serves as interim coordinator for USDA-ARS Minor Use Pesticide Program for Food and Ornamental Horticulture. Alvin has authored/co-authored 104 refereed journal articles, has provided more than 300 technical reports to the national IR-4 program (resulting in over 200 pesticide labels for specialty crops), and has presented over 200 research papers. Alvin led graduate and undergraduate students in his laboratory while serving as adjunct with Claflin University, Clemson University, and College of Charleston. Alvin has served ESA in many roles including: co-chair of the 2016 International Congress of Entomology, Entomological Foundation Board of Counselors, chair of the International Affairs Committee, president of the Southeastern Branch-ESA, Program Committee co-chair, Committee on Education and Youth, Linnaean Committee, etc. He currently serves on the 2020 ICE Organizing Committee, Host Plant Resistance to Insect Steering Committee, and others. Alvin's honors include: first Department of Entomology Distinguished Alumni Award at University of Kentucky, IR-4 Meritorious Award, SEB-ESA Award for Excellence in IPM, SEB-ESA Recognition Award in Entomology, and Fellow of the Royal Entomological Society.

Nan-Yao Su Award for Innovation and Creativity in Entomology

Each year this award is given to an ESA member who is able to demonstrate through his or her projects or accomplishments an ability to identify problems and develop creative, alternative solutions that significantly impact entomology.

Dr. Subba Reddy Palli is a professor of entomology at the University of Kentucky. He is internationally recognized for his research on hormonal regulation of molting, metamorphosis, and reproduction, development of ecdysone receptor-based gene switches, and RNAi-based pest management. He has published 170 journal articles and book chapters and co-edited a book. He is also a co-inventor on 28 patents. Dr. Palli received his doctorate from the University of Western Ontario and trained as a postdoctoral fellow at the University of Washington. Subsequently, Dr. Palli worked at the Canadian Forest Service and Rohm and Haas Company. He joined the University of Kentucky's Department of Entomology in 2002; currently, he serves as the chair of this department. Dr. Palli has received several prestigious awards at the University of Kentucky, including a University Research Professorship, Fulbright-Nehru Award, the Thomas Poe Cooper Research Award, the Bobby Pass Excellence in Grantsmanship Award, the High Impact Research/ Extension Award, the High Impact Paper Award, and the Wethington Award. Dr. Palli was named as an ESA Fellow in 2014 and is also the recipient of the ESA Recognition Award in Insect Physiology, Biochemistry, and Toxicology. He has organized and chaired several symposia at ESA annual meetings and international conferences. Dr. Palli also served as president of the ESA's Physiology, Biochemistry, and Toxicology Section. He currently serves on the editorial boards of 10 journals and served on grant review panels of NSF, USDA, and NIH. He also serves as the co-director of the Center for Arthropod Management Technologies, NSF Industry and University Cooperative Research Center.

Recognition Award in Insect Physiology, Biochemistry, & Toxicology

This award, sponsored by Apex Bait Technologies Inc., recognizes and encourages outstanding extension, research, and teaching contributions in urban entomology.

Dr. Mariana Federica Wolfner is the Goldwin Smith Professor of Molecular Biology and Genetics, and a Stephen H. Weiss Presidential Fellow, at Cornell University. After receiving her B.A. in biology and chemistry from Cornell, she did Ph.D. research in biochemistry at Stanford University, and postdoctoral work at the University of California, San Diego. Dr. Wolfner studies the molecular, genetic, and physiological underpinnings of reproduction and fertility. After graduate and postdoctoral studies that identified critical genes in *Drosophila*'s steroid-response and sex determination, respectively, Dr. Wolfner established her lab at Cornell. There, she and her students and postdocs utilized molecular genetics to show that males' seminal proteins modulate the physiology, behavior, and longevity of mated female *Drosophila* and *Aedes* mosquitoes (the latter in collaboration with Laura Harrington at Cornell). The Wolfner lab identified mechanisms by which specific seminal proteins interact with female molecules or neurons to regulate phenomena such as egg production, reproductive physiology, and female sperm choice (the latter in collaboration with Andrew Clark at Cornell). In another area, the Wolfner Lab uncovered how insect eggs "activate" to undertake

embryogenesis upon fertilization, revealing both insect-specific and highly-conserved triggers for this process. Dr. Wolfner has mentored nearly 40 graduate students and 30 postdoctoral scholars, as well as more than 80 undergraduate or high school students. She is a Fellow of the American Association for the Advancement of Science, and has also received awards for her teaching and mentorship. Dr. Wolfner publishes actively, and serves on multiple editorial boards and grant panels, and on boards of scientific societies.

Recognition Award in Urban Entomology

This award recognizes and encourages outstanding extension, research, and teaching contributions in urban entomology.

Dr. Brian T. Forschler is professor of entomology at the University of Georgia (UGA), and P.I. for the Household and Structural Entomology Research Program. He received three higher degrees, all in entomology specializing in insect pathology, with a B.S. and M.S. from the University of Kentucky and Ph.D. from the University of Georgia. Prior to joining UGA in 1991, Dr. Forschler worked on a postdoctoral appointment at the University of Arkansas.

Dr. Forschler has a teaching and research appointment that includes, over the last two decades, teaching graduate and undergraduate-level courses on urban entomology and IPM. He has acted as major advisor for 11 postdoctoral associates, six Ph.D. students, and 12 master's students and directed studies for 18 undergraduates, in addition to sitting on 16 student advisory committees. Dr. Forschler is chairperson for the Termiticide Scientific Review Panel and is a member of the ASPCRO Termiticide Label Review Committee and the Georgia Department of Agriculture Structural Pest Control Commission. He has had cooperative research agreements with Madihol University in Bangkok, Thailand, the RISH Institute at Kyoto University, the BAM Institute in Berlin, Germany, and the Vietnam Academy for Water Resources in Hanoi, Vietnam; he has organized 13 national and international symposia on urban insect pest biology/management. He is author of over 100 scientific and popular press articles on household and structural insect pests and has conducted training sessions for industry and regulatory officials in the United States, Europe, Australia, and Asia.

Thomas Say Award

This ESA award acknowledges significant and outstanding work in the fields of insect systematics, morphology, or evolution.

Dr. Michael S. Engel grew up in the 1970s exploring the environs about his family's homes in California and Arizona. He eventually matriculated at the University of Kansas, receiving a B.S. in physiology and cell biology and a B.A. in chemistry (1993), and then proceeded to Cornell University for a Ph.D. in systematic entomology (1998). He served as a research scientist at the American Museum of Natural History in New York for two years before returning to the University of Kansas, where he is today a professor in the Department of Ecology & Evolutionary Biology and senior curator in the Natural History Museum's Division of Entomology.

Dr. Engel is an internationally recognized systematic entomologist and invertebrate paleontologist, working broadly on the evolutionary history of arthropods and most widely known for co-authoring *Evolution of the Insects* (2005). His research has contributed to an understanding of the geological history, phylogenetic relationships, past and present diversity, and evolution of many insect and related arthropod lineages, conducting work in 40 countries. He is also known for his studies on the systematics and biology of modern bees and Zoraptera.

Among other awards, Dr. Engel was honored previously as a Guggenheim Fellow (2006), Fellow of the Linnean Society of London (2000), Fellow of the Paleontological Society (2008), and recently as an ESA Fellow (2017).

Early Career Professional (ECP) Awards

Henry & Silvia Richardson Research Grant

This grant provides research funds to postdoctoral ESA members who have at least one year of promising work experience, are undertaking research in selected areas, and have demonstrated a high level of scholarship.

Dr. Justin George is a postdoctoral researcher at the USDA-ARS U.S. Horticultural Research Lab, Fort Pierce, Florida. He received a B.S. in agriculture from Kerala Agricultural University in Kerala, India. He completed his M.S. in entomology at University of Kentucky with Dr. Daniel Potter, and his Ph.D. at

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Pennsylvania State University with Dr. Thomas Baker. His Ph.D. work focused on the chemical ecology and neuroethology of the malaria mosquito, *Anopheles stephensi*. He showed how the peripheral olfactory responses of mosquitoes are altered following infection by fungal and plasmodium pathogens. Dr. George's postdoctoral research with Dr. Stephen Lapointe focuses on understanding the Asian citrus psyllid's chemical ecology, neurophysiology, and host-vector-pathogen interactions involved in citrus greening disease. He discovered and optimized a three-component phagostimulant blend that dramatically increases psyllid probing. His current research focuses on developing an attract-and-kill device by taking advantage of the psyllid's response to color, odor, and surface chemistry, thereby minimizing the use of broad-spectrum insecticides.

Dr. George has used electrical penetration graph (EPG) as a tool to understand the feeding behavior of Asian citrus psyllid nymphs and adults. He described resistance mechanisms that inhibit stylet penetration of phloem elements in citrus leaves. He extended the utility of EPG by generating machine learning algorithms for automated classification of EPG waveforms. He has authored/co-authored 16 peer-reviewed publications, and has given 40+ scientific presentations at national and international venues. Dr. George is a member of the Program and Student Awards Committees for the Southeastern branch of ESA.

Early Career Innovation Award

This award, sponsored by BASF, honors young professionals working within the field of entomology who have demonstrated innovation through contributions within any area of specialization.

Dr. Joshua Benoit received his doctorate from The Ohio State University studying stress tolerance in terrestrial arthropods. His postdoctoral research was at Yale University on tsetse fly reproductive physiology. Currently, Dr. Benoit's research at the University of Cincinnati centers on the integrative physiology of arthropods, particularly stress tolerance, dormancy-induced changes, and reproduction using sanguinivorous and non-sanguinivorous arthropod models. Dr. Benoit has published over 100 research papers on arthropod biology since 2003 with over 50 focused on blood-feeding arthropods. The highlights are the publication of the bed bug and tsetse fly genomes (*Nature Communications* and *Science*, respectively), *Annual Review of Entomology* and *eLife* publications on tsetse reproduction and development, and a recent publication on tick stress biology that was an Editor's Choice in the *Journal of Experimental Biology*. Along with his publication record, Dr. Benoit has presented on over 150 occasions, has received 40 scientific awards, and has served as a grant/award reviewer for multiple agencies, including the National Science Foundation, South African National Research Foundation, National Institutes of Health, and the Entomological Society of America. During his time at the University of Cincinnati, more than 30 undergraduates have performed research within the Benoit Lab and are included on eight publications. In addition to his research, Dr. Benoit is involved in multiple outreach projects, including a 10-week course for the Cincinnati Public Schools on arthropod vector biology and the impact of arthropod-associated diseases on human health and agricultural development.

ECP Outreach and Public Engagement Award

This award honors a student transition or early professional working within the field of entomology who has demonstrated excellence, leadership, and creativity in outreach and public engagement.

Nancy Miorelli earned her B.S in biology from Union College before graduating with her M.S. in entomology from the University of Georgia. Upon graduation, Nancy relocated to Ecuador, where she is currently residing in the heart of the Ecuadorian Cloud Forest in the Maquipucuna Reserve.

Within the Maquipucuna Reserve, Nancy gives presentations highlighting insects that can be found in the Ecuadorian cloud forest and their ecology. Nancy routinely gives guided tours both during the day and at night to show visitors the insects found within the reserve. She designs environmental education programs for Ecuadorian students, aids in student research projects, and gives guest lectures to universities and EcoLodges throughout Ecuador.

Nancy promotes science communication online as well. She is the co-founder and co-author of the blog "Ask an Entomologist," which seeks to help people answer their questions about insects. Nancy has also been featured on the Twitter account "Real Scientists," which boasts over 52,000 followers. This opportunity popularized her hashtag #facebug, which aims to show a diversity of arthropods and disseminate information about their conservation status, research importance, and biology.

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It has been featured in magazines and newspapers around the world and was featured on NPR.

Finally, in her free time, Nancy makes entomological, conservation-minded jewelry featuring Ecuadorian materials. Profits from this initiative, along with Nancy's personal time and effort, go to her housing project providing homes to those people who lost everything during the series of earthquakes that plagued the Ecuadorian coast in 2016.

ECP Extension Award

This award is given to a student transition or early professional who excels in entomological extension.

Dr. Kelly Hamby is an assistant professor and extension specialist in the Department of Entomology at the University of Maryland-College Park. She received her B.S. in environmental toxicology at the University of California-Davis, and her M.S. and Ph.D. in entomology with Dr. Frank Zalom at the University of California-Davis, where she was supported by an NSF graduate research fellowship. Her research and extension program addresses invasive and emerging insect pest issues, evaluating and optimizing pest management programs, and development of sustainable alternative management tactics.

Dr. Hamby is particularly interested in understanding and exploiting insect interactions with free-living microorganisms for sustainable pest management. Her current work includes characterizing spotted wing drosophila's interactions with yeast and fruit rot microorganisms and developing cultural control tactics for this invasive pest of small fruit. Her lab is also evaluating the pest suppression benefits and non-target impacts of neonicotinoid seed treatments in mid-Atlantic grain crop rotations. Dr. Hamby delivers timely, research-based extension programming via extension publications, field days, and winter meetings, serving the needs of Maryland's grain producers and diversified small fruit farmers. In addition to her research and extension responsibilities, Dr. Hamby teaches integrated pest management and provides K-12 outreach with hands-on pest management activities.

ECP Research Award

This award recognizes a student transition or early professional who has made outstanding research contributions to the field of entomology.

Dr. Daniel R. Swale started as an assistant professor of entomology at Louisiana State University in April 2015. Dr. Swale received broad training in insect neurophysiology and toxicology during his master's (Virginia Tech) and doctoral (University of Florida) studies that aimed to characterize the biochemical, physiological, and toxicological properties of the acetylcholinesterase enzyme within multiple arthropod disease vectors. As a postdoctoral fellow at Vanderbilt Medical Center (Department of Anesthesiology), Dr. Swale received training on the molecular physiology, chemical genetics, and electrophysiology of insect and mammalian potassium ion channels. Dr. Swale has since established his own research program that aims to define the physiological role and toxicological potential of underexplored ion channels to ultimately provide insights into future target sites for arthropod control. At Louisiana State University, the areas of emphasis for the Swale Lab are to 1) characterize the molecular physiology of K+ ion transport pathways in the nervous system of insects, 2) define the pathways for transepithelial ion and fluid secretion within the acini of arthropod salivary glands, 3) characterize and exploit novel physiological pathways to enhance honey bee health, and 4) develop translational delivery methods for the dissemination of products.

In addition to scientific advancements that are broadening the scope of entomology, his program provides the opportunity for K-12, undergraduate, and graduate students to receive hands-on research experience in the fields of neurophysiology and neurobiology. As a teacher, Dr. Swale strives to make molecular, physiological, and toxicological concepts accessible to students from all disciplines.

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ECP Teaching Award

This award is given to a student transition or early professional who excels in entomological education.

Dr. Erika Machtinger is an assistant professor at Penn State University. Her research focuses on arthropod pests of veterinary concern. Along with being an entomologist, Erika is also a Certified Wildlife Biologist® and specializes in zoonotic and other vector-borne diseases in wildlife and equine systems.

Erika holds a B.S. from the University of Delaware in wildlife conservation and ecology, and an M.S. and Ph.D. in entomology from the University of Florida. As a graduate student, Erika worked on biological control agents of filth flies under Dr. Chris Geden of the USDA-ARS Center for Medical, Agricultural, and Veterinary Entomology. Her postdoctoral work focused on integrated tick management at the USDA-ARS in Beltsville, Maryland, under Dr. Andrew Li.

As a graduate student at the University of Florida, Erika was the teaching assistant supervisor for the Introduction to Entomology Laboratory. In collaboration with her faculty supervisor and teaching mentor Dr. Christine Miller, Erika developed syllabi and lesson plans and coordinated six to seven sections of the course, serving as a mentor for new graduate student TAs. Erika developed an original lesson plan for this course, which was published in *American Biology Teacher*, and won the University of Florida Graduate Teaching Award.

While her current appointment does not include a teaching assignment at Penn State, Erika will be actively engaged in Extension activities, and will be able to continue to develop her teaching skills with a new demographic of adult learners.

Entomological Society of America Certification Corporation Awards

Distinguished Service Award to the Certification Program

The purpose of this award is to encourage, recognize, and reward outstanding contributions to the ESA Certification Program and the professionalism of entomology.

Dr. Rebecca Baldwin is an associate professor and is the undergraduate coordinator for the University of Florida (UF) Entomology and Nematology Department. She became interested in entomology as a child through the 4-H club in Ouachita Parish, Louisiana, and shares her love of entomology and education by directing the UF Entomology Education and Outreach Program (The Bug Club), by mentoring and advising students, by volunteering for the Entomological Foundation, and by teaching general education and introductory entomology courses to undergraduates. Her research program focuses on entomology education and integrated pest management tools for crawling insect control. Outside of the classroom, Rebecca provides CEU and recertification training for educators, pest control operators, and mosquito managers, as well as for pest management associations. Rebecca is a Board-Certified Entomologist, serves on the ESA Education and Outreach Committee, and is on the Board of Directors for the Entomological Foundation. Rebecca regularly provides workshops for pest managers who aspire to become Associate Certified Entomologists.

Rebecca holds a Ph.D. from the University of Florida, where her research focused on people's perceptions of pest management and integrated pest management of cockroaches using fatty acid salts. She received her B.A. and M.S. degrees in biology from the University of Louisiana-Monroe. She lives in North Central Florida, where she and her husband Richard are active members of Westside Baptist Church.

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ACE Professional Award

The purpose of the award is to recognize superior contributions of an ACE in the field of structural pest management.

Alan Feuer, ACE, is currently the technical director and lead ACE for Preventive Pest Control (PPC), Albuquerque, New Mexico.

Alan began his career in pest management in 1989 following a tour in the U.S. Marine Corps. Alan's current duties include training and development for technical/sales/customer service support personnel for PPC as well as designing service protocols and SOP in support of pest management operations.

Alan serves as the PPC liaison to the Greater Albuquerque Association of Realtors (GAAR), where he currently is serving as the Affiliates Committee chairman, and is a certified instructor for the New Mexico Real Estate Commission (NMREC). He is also the current secretary/treasurer and training coordinator for the New Mexico Pest Management Association (NMPMA) and is the 2017-2018 chair of the Wood Destroying Organism (WDO) Committee of the National Pest Management Association (NPMA).

Outbound training is one of Alan's passions, and he is blessed to be able to spend about 20% of his time instructing or preparing classes for Greater Albuquerque Association of Realtors (GAAR), New Mexico Real Estate Commission (NMREC), New Mexico Pest Management Association (NMPMA), or other local groups. His latest investment is to partner with property managers and elder care providers in the realm of better understanding how to best avoid or mitigate bed bugs in the homes of the most financially/physically/resource-challenged members of our community.

Alan wants to thank all of his mentors from NMPMA for their wisdom, counsel, and encouragement, and also the industry instructors, vendors, and manufacturers who invested in providing training and education to the pest management industry in New Mexico.

Entomological Foundation Awards

President's Prize for Outstanding Achievement in Primary Education

This award recognizes educators who have gone beyond the traditional teaching methods by using insects as educational tools in grades K-6.

Lara Guerra teaches elementary science to girls in pre-kindergarten through second grade at the Hockaday School in Dallas, Texas. She also coordinates the Hockaday Lower School Garden and is currently developing an interdisciplinary garden curriculum for students in the Lower School. Hockaday is the largest girls' school in the United States, and Lara has a deep belief in the transformative power of a single-sex education for girls and young women.

Lara is a Texas native and grew up in the Dallas-Fort Worth area at a time when children would play outside until the street lights came on. She spent many happy hours with her brothers in the fields behind her house. Insects, birds, lizards, and building forts in the woods filled her formative years; in the process, she absorbed a deep love and respect for nature. Her interests in gardening and hobby beekeeping are a direct result of her childhood experiences.

Lara's childhood experiences also inform her work as a teacher, and she is committed to providing similar hands-on learning opportunities for her young students. In the classroom, she delights in weaving the arts, humanities, and science together into a cross-curricular learning experience. She encourages her students to engage nature, and the "Wonder Wall" outside her classroom door is a repository of all of the wonderful rocks, insects, leaves, and treasures that her students find and bring to school.

Lara received her B.A. from Smith College in Northampton, Massachusetts, and her M.L.S. from Southern Methodist University in Dallas, Texas.

Awards Breakfast: ESA Professional Awards, ECP Awards, Certification Awards, and Foundation Awards

President's Prize for Outstanding Achievement in Secondary Education

This award recognizes educators who have gone beyond the traditional teaching methods by using insects as educational tools in grades 7-12.

Gregory Bisbee has been teaching high school science and biology since 1988 and currently teaches biology, biotechnology, and a plant-based advanced ecology course at Arrowhead High School in Hartland, Wisconsin. He has the reputation of being "that teacher"—the one who makes class very challenging, but interesting and fun. In the words of his students, "… he's a great teacher if you really care about learning biology." His students planted, and now help to maintain, several acres of prairie and woodland on the school campus. It is in these areas that they conduct population studies, pollinator observations, and other lab activities. Greg is passionate about teaching and learning, and gets really excited about native plants and insects. He frequently presents at local, state, regional, and national science education conferences and has several publications. He is a past recipient of the Outstanding Biology Teacher Award for Wisconsin (2007) and enjoys participating in programs that allow him to travel and work on research, always looking for new techniques to use in the classroom. He lives on a five-acre prairie with his wife, Pam, and a large, unruly Great Pyrenees named Miley.

YouTube Your Entomology Stinger Awards (2017 Finalists)

"Ant Plants: Cecropia – Azteca Symbiosis"
Peter Marting and Andrew Quitmeyer

"Bt Sweet Corn: Is It Safe to Eat?"
Galen Dively, Ian Howard, and Taylor Schulden

"Method to Create a "Window" Into a Butterfly Wing"
Aaron Pomerantz

"The Odd Couples: Pollinators"
Ethel M. Villalobos, Jonathan Wright, and Jonathan Koch

"The Soil Food Web"
Maxwell Helmberger

Student Awards Ceremony: ESA Student Awards

The winners of the Student Competition for the President's Prize, ESA Student Awards, Linnaean Games, and Student Debates will be announced on Tuesday, November 7, starting at 6:30 PM in the Four Seasons Ballroom of the Convention Center.

John Henry Comstock Graduate Student Awards

These six awards are given to one graduate student from each ESA Branch to promote interest in entomology and to stimulate interest in attending the ESA Annual Meeting.

Dr. Flor Edith Acevedo (Eastern Branch) is currently a research associate at the Colombian Center for Coffee Research, Cenicafé. She received her Ph.D. in entomology from The Pennsylvania State University in 2016, under the supervision of Dr. Gary Felton. Her dissertation research focused on the study of plant defense responses induced by insect herbivores and counter insect adaptation mechanisms. The results of this work highlight the importance of insect physiological, morphological, and behavioral plasticity as key factors that enable the utilization of different host plants. Flor E. received her bachelor's degree in agronomy from Universidad de Caldas (Colombia) in 2006; in her undergrad thesis research, she developed DNA molecular markers for the coffee berry borer, *Hypothenemus hampei*, to study the dispersion of this insect. She then joined the entomology team at Cenicafé, where she studied the genetic variability of the coffee berry borer in Colombia. In 2006, she was a short-term scholar at the University of Florida Tropical Research and Education Center, TREC, where she searched for natural enemies of the avocado lace bug *Pseudacysta perseae*. During this short visit, Flor E. made important contributions that led to three research papers published in 2008-2009; notably, she was able to find a new predator of avocado lace bugs, *Tingidoletes praelonga* Gagné (Diptera: Cecidomyiidae), which was classified in a genus and species new to science. In 2010, she started her Ph.D. program at Penn State partially sponsored by a Fulbright scholarship. Part of her dissertation has been published in two recent research papers (2017), and four more are in the process of submission. Flor E. is strongly captivated by research in the field of insect-plant interactions and would like to use genetic engineering techniques to study intrinsic mechanisms shaping these interactions with the ultimate goal of increasing host plant resistance to biotic stress.

Dr. Chong Chin Heo (Southwestern Branch) was born and raised in Malaysia. He obtained his bachelor's in biomedical sciences (Hons.) (2006) and master's in medical science (parasitology) (2009) from the National University of Malaysia. He then earned his Ph.D. from the Department of Entomology, Texas A&M University, in 2016. He is currently a faculty member at the Faculty of Medicine, Universiti Teknologi MARA, Malaysia. Prior to that, he was a research officer at the Institute for Medical Research, Kuala Lumpur. His research interests are carrion decomposition ecology, biodiversity of necrophagous and coprophagous dipteran species, and forensic entomology/acarology. As of 2017, he has published 43 peer-reviewed journal articles, one book, and one book chapter. He has delivered more than 70 platforms and poster presentations at local and international conferences. He received the Perdana Scholar Award from the Malaysian Embassy at Washington, DC (2016); the Vice President Award for Research Excellence from Texas A&M University (2015); and a scholarship from the Medical, Urban, and Veterinary Entomology Section, Entomological Society of America, during the 2015 ESA Conference at Minneapolis. Chong Chin was also a team member in the ESA Linnaean Games representing Texas A&M University. Additionally, Chong Chin has been a Board-Certified Entomologist (BCE) since 2016. Currently, he is the assistant secretary for the Malaysian Society of Parasitology and Tropical Medicine (MSPTM), member of the North American Forensic Entomology Association (NAFEA), and member of the European Association for Forensic Entomology (EAFE).

Dr. Amelia Lindsey (Pacific Branch) received her Ph.D. from the University of California-Riverside (UCR), under the direction of Dr. Richard Stouthamer. Amelia received her bachelor's degree in biological sciences *cum laude* from San José State University, where she became enamored with insects and their symbioses. Her dissertation research focused on the genomic and evolutionary consequences of infection with parthenogenesis—inducing *Wolbachia*, in the parasitoid wasp *Trichogramma*. During her time as a Chancellor's Fellow at UCR, she was awarded an NSF Doctoral Dissertation Improvement Grant, a USDA NIFA Predoctoral Fellowship, two van den Bosch Scholarships for Research in Biological Control, and

Student Awards Ceremony: ESA Student Awards

multiple UCR scholarships. In addition to research, she enjoyed coaching for the Science Olympiad, leading outreach events for the Inland Empire community, and moderating the social media pages for UCR Entomology and the Annual Riverside Insect Fair. As a student member of ESA, she organized symposia, competed with the UCR Linnaean Games team, including the 2013 national champion team, and won several President's Prize presentation awards. She is now a postdoctoral research associate at Indiana University, working with Drs. Irene Newton and Richard Hardy on the functional genomics of *Wolbachia*-mediated pathogen blocking.

Ashley Mortensen (Southeastern Branch) is a University of Florida (UF) doctoral candidate in the Entomology & Nematology Department. She received a B.S. in animal science from Texas A&M University in 2005 and an M.S. in entomology from UF in 2013. Ashley's current research aims to determine if key honey bee behaviors are instinctual or learned by examining the role that the juvenile rearing environment plays on adult behavior. *In vitro* rearing of honey bee brood is an emerging risk assessment tool that has been implemented in compound safety screening requirements for the OECD. Ashley's research will better inform how investigators interpret the findings of these risk assessments. Ashley is an active contributor to UF's teaching and extension programs. She has developed and taught a beekeeping field techniques course; redesigned, taught, and assisted the department's online beekeeping course; led Introduction to Entomology laboratory sections; and provided numerous guest lectures and field presentations for departmental courses. To share relevant research findings and beekeeping knowledge with a broader audience, Ashley co-created a social medial strategy via Twitter, Instagram, and Facebook (@UFHoneyBeeLab), through which she shares research updates and other honey bee related information to over 7,500 followers across the three sites. Ashley also produces blog and newsletter posts, extension reports, web-based presentations, in-person presentations, and workshops. Ashley is graduating this December, and she is actively pursuing future teaching, research, and extension opportunities in apiculture and behavioral ecology.

Dr. Kayla I. Perry (North Central Branch) received her Ph.D. in entomology from The Ohio State University in 2016 where she was advised by Dr. Daniel A. Herms. Kayla's research focused on elucidating mechanisms that explain the role of natural and anthropogenic disturbances in maintaining ground-dwelling arthropod diversity, structure, and function in forest ecosystems. She proposed three dynamic conceptual models describing the temporal relationship in the effect sizes of canopy gaps and woody debris caused by disturbance from emerald ash borer, intense winds from a tornado, and salvage logging on ground-dwelling arthropod communities. Her work has identified canopy gap formation following tree mortality as a primary driver of ground-dwelling arthropod diversity and community structure. Kayla developed a novel self mark-capture technique using fluorescent powder to investigate the movement of arthropods in the field. She found the dispersal of ground-dwelling arthropods was generally limited, and movement was further reduced following disturbance to the forest canopy and understory, suggesting slow recolonization after disturbance with implications for ecosystem services. Kayla received a B.S. in biology from Baldwin Wallace College in 2010, and participated in the Research Experience for Undergraduates program at the Rocky Mountain Biological Laboratory in 2009, where she was advised by Dr. Kailen A. Mooney. Kayla is currently a postdoctoral researcher working with Dr. Mary M. Gardiner investigating mechanisms of ground-dwelling arthropod community assembly in urban landscapes using a functional trait-based approach.

Isobel Ronai (International Branch) began her career at The University of Sydney, Australia, with a B.Sc. (Honors, Class 1) majoring in biology and history and philosophy of science. In 2013, Isobel started her Ph.D. in the Behavior and Genetics of Social Insects Laboratory under Professor Ben Oldroyd. Isobel's Ph.D. investigated the genetic and mechanistic basis of worker sterility in the honey bee. The evolution of sterility is a conundrum because workers "altruistically" forgo personal reproduction. Isobel utilized an evo-devo framework to propose that the mechanistic basis of worker sterility can be conceptualized as "reproductive control points," which reduce the reproductive capacity of workers. Isobel's research showed that the mechanism underlying the reproductive control points is

programmed cell death. Isobel's thesis is therefore an important contribution to a mechanistic understanding of worker sterility, and provides insights into how this trait emerged from a solitary ancestor. She recently submitted her Ph.D. thesis, which was accepted without any changes, and all chapters (five papers) have been published in leading journals.

Isobel is a highly motivated early career researcher who has been awarded 30+ competitive research grants, prizes, and travel awards. During the four years of Isobel's Ph.D., she presented at seven international and 11 national conferences. Isobel is heavily involved in entomological and genetics societies. She is the International Branch representative on the Early Career Professionals Committee of ESA and helped organize an ENTOMOLOGY 2017 Program Symposium. Isobel is particularly fascinated by genetics and will pursue a research career in the genetics of insects.

ESA Student Awards

Larry Larson Graduate Student Award for Leadership In Applied Entomology

This ESA award, sponsored by Dow AgroSciences, recognizes Dr. Larry Larson's role as a leader and pioneer in insect management and carries that legacy to the next generation of leaders in applied entomology.

John Gordy received his B.S. from Texas A&M University with a double major in agronomy and entomology. He received his M.S. in entomology from Louisiana State University working with Drs. Michael Stout and Rogers Leonard in the rice and cotton labs, where his thesis focused on induced defenses in cotton, rice, corn, and soybean. He is currently pursuing a Ph.D. at Texas A&M University under Drs. Michael Brewer and Mo Way. His dissertation research includes threshold development and management of sugarcane aphid in grain sorghum.

In addition to his studies, John is a full-time extension agent with Texas A&M AgriLife Extension. He is passionate about agriculture and enjoys being able to interact with producers on a day-to-day basis to better understand their challenges and help them identify solutions. He enjoys getting to work closely with several growers to conduct on-farm research in the Upper Gulf Coast Region of Texas. Being a former teacher, he also enjoys educating youth and providing mentorship to undergraduate and high school students interested in agriculture.

In the future, John hopes to be able to work cooperatively with growers, researchers, industry, and other extension personnel to evaluate existing and propose new methods for scouting crops and making management decisions for pests in Texas and the southern United States. John would like to thank the Entomological Society of America and Dow AgroSciences for sponsoring this prestigious award.

Lillian and Alex Feir Graduate Student Travel Award in Insect Physiology, Biochemistry, or Molecular Biology

The purpose of this ESA award is to encourage graduate students working with insects or other arthropods in the broad areas of physiology, biochemistry, and molecular biology to affiliate with ESA's Physiology, Biochemistry, and Toxicology Section and to attend the ESA Annual Meeting.

Dr. Isobel Ronai began her career at The University of Sydney, Australia, with a B.Sc. (Honors, Class 1) majoring in biology and history and philosophy of science. In 2013, Isobel started her Ph.D. in the Behavior and Genetics of Social Insects Laboratory under Prof. Ben Oldroyd. Isobel's Ph.D. investigated the genetic and mechanistic basis of worker sterility in the honey bee. The evolution of sterility is a conundrum because workers "altruistically" forgo personal reproduction. Isobel utilized an evo-devo framework to propose that the mechanistic basis of worker sterility can be conceptualized as "reproductive control points," which reduce the reproductive capacity of workers. Isobel's research showed that the mechanism underlying the reproductive control points is programmed cell death. Isobel's thesis is therefore an important contribution to a mechanistic understanding of worker sterility, and provides insights into how this trait emerged from a solitary ancestor. She recently submitted her Ph.D. thesis, which was accepted without any changes, and all chapters (five papers) have been published in leading journals.

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Student Awards Ceremony: ESA Student Awards

ESA Student Activity Award

Sponsored by Monsanto Company, this award will be presented annually to recognize a student for outstanding contributions to the Society, his/her academic department, and the community, while still achieving academic excellence.

Alix Whitener is a Ph.D. candidate at Washington State University under the advisement of Dr. Elizabeth Beers. Her research on spotted wing drosophila (SWD) spans much of the integrated pest management spectrum: behavior, monitoring, low-impact control methods, pesticide efficacy, and resistance monitoring. She recently spent five months in Sweden exploring relationships between SWD and *Hanseniaspora uvarum* yeast in Dr. Peter Witzgall's chemical ecology laboratory. Alix graduated from Western Washington University (WWU) with a B.S. in anthropology and biology, minoring in women's studies, and competing on WWU's NCAA women's rowing team. She worked seasonally as a technician in the Beers' laboratory studying natural enemies in tree fruit.

Alix serves as chair of the Student Affairs Committee (SAC), organizing student activities including the Student Debates, Student Symposium, and more. She has served as president of WSU's Entomology Graduate Student Association, coordinating many of the club's outreach events, and as a graduate student representative to numerous academic committees at WSU. In her community, Alix volunteers as a judge and clinician in 4-H, mentors high school seniors as they prepare for college, and organizes outreach events for the North Central Washington Beekeeping Association.

Alix has previously been awarded the Larry Larson Graduate Student Award for Leadership in Applied Entomology, the Student Certification Award through ESA's BCE program, the Pacific Branch Student Leadership Award, and various ESA President's Prize awards. After graduation, Alix will pursue a career in industry or cooperative extension.

Student Certification Award

This award recognizes and encourages outstanding entomology graduate students with interest in the mission of the ESA certification program.

Lina Bernaola was born in Lima, Peru. She received her B.S. in biological sciences and a minor in molecular biology from Universidad Nacional Mayor de San Marcos, Peru. Her professional experience, as well as her passion in the world of plants, began when she joined the International Potato Center (CIP) in Lima to perform her undergraduate thesis. Based on this experience, Lina joined Louisiana State University (LSU) to pursue her M.S. in agronomy and crop sciences. Currently, she is a Ph.D. candidate in the Department of Entomology at LSU under the supervision of Dr. Michael Stout. Her research interests include plant-insect and plant-pathogen interactions as well as host plant resistance. Her project involves investigations of the mechanistic basis of plant resistance against above-ground and below-ground organisms in rice. Primarily, she studies the effects of mycorrhizal fungi, a symbiotic soil-borne organism, on rice resistance to insect herbivores. The ultimate goal of Lina's research is to provide a better understanding of plant-insect-mycorrhizae interactions in rice pests of Louisiana, which will help to develop more effective pest management programs in rice. Lina has been actively involved in the Entomological Society of America since 2013. She has presented her research at several national and Southeastern Branch meetings. She also enjoys conducting educational outreach about insects to kids with the Entomology Club at LSU.

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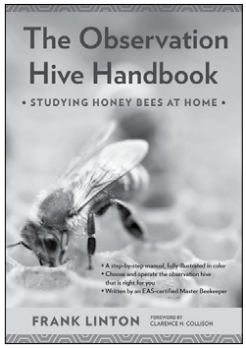

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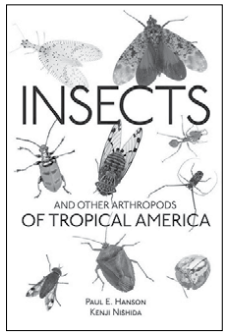

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FRIDAY, NOVEMBER 3

TIME	SESSION/FUNCTION	LOCATION
8:00 AM – 5:00 PM	Annual Review of Entomology Editorial Committee Meeting	Quartz, Hyatt Regency
6:00 PM – 9:00 PM	CAMTech IAB Meeting	Meeting Room 401/402, Convention Center

SATURDAY, NOVEMBER 4

TIME	SESSION/FUNCTION	LOCATION
7:30 AM – 5:00 PM	CAMTech Full Day IAB Meeting	Meeting Room 401/402, Convention Center
7:30 AM – 2:00 PM	Certification Corporation & Governing Board Meeting	Mineral Hall F/G, Hyatt Regency
8:00 AM – 6:00 PM	Entomological Collections Network	Meeting Room 607, Convention Center
8:00 AM – 5:00 PM	S_Temp2018: The Working Group on Improving Microbial Control of Arthropod Pests	Meeting Room 606, Convention Center
10:00 AM – 2:00 PM	STEMbugs Educator Workshop	Meeting Room 301/302/303, Convention Center
12:00 PM – 5:00 PM	Tour: Fun in the Foothills	E Concourse, Convention Center
2:00 PM – 2:30 PM	Moderator Training	Meeting Room 501, Convention Center
3:00 PM – 3:30 PM	Student Competition Judges Training	Meeting Room 502, Convention Center
3:00 PM – 6:00 PM	Council of Entomological Department Administrators Meeting	Centennial H, Hyatt Regency
3:00 PM – 6:00 PM	Presentation Preview Room (PPR)/Speaker Ready Room	Meeting Room 210/212, Convention Center
3:00 PM – 6:00 PM	Registration and Information Center	E Concourse, Convention Center
3:30 PM – 5:00 PM	P-IE Section Governing Council Meeting	Mineral Hall F/G, Hyatt Regency
5:00 PM – 7:00 PM	Section Governing Council Meeting	Centennial G, Hyatt Regency
7:00 PM – 9:00 PM	Entomological Collections Network Dinner	Meeting Room 603/605, Convention Center

SUNDAY, NOVEMBER 5

TIME	SESSION/FUNCTION	LOCATION
6:00 AM – 8:00 AM	The Lightning Bug Run	E Concourse, Convention Center
6:30 AM – 7:45 AM	Sunrise Session: Achieving Success as a Mentor Through Implementation of Effective Mentoring Strategies	Meeting Room 705/707, Convention Center
6:30 AM – 7:45 AM	Sunrise Session: “Bugs on Bugs”: An Inquiry-Based, Collaborative Activity to Illustrate the Diversity of Arthropods and their Symbionts	Meeting Room 704/706, Convention Center
7:00 AM – 7:30 AM	Moderator Training	Meeting Room 501, Convention Center
7:00 AM – 6:00 PM	Presentation Preview Room (PPR)/Speaker Ready Room	Meeting Room 210/212, Convention Center
7:00 AM – 9:00 PM	Registration and Information Center	E Concourse, Convention Center
7:00 AM – 5:00 PM	Student Competition Judges Break Room	Meeting Room 701, Convention Center
7:00 AM – 7:30 AM	Student Competition Judges Training	Meeting Room 502, Convention Center
7:00 AM – 7:50 AM	USDA - ARS All Hands Meeting	Meeting Room 303, Convention Center
7:30 AM – 12:00 PM	CAMTech Sunday Morning IAB Meeting	Meeting Room 401/402, Convention Center

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SUNDAY, NOVEMBER 5 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
7:30 AM – 12:00 PM	Entomological Collections Network Day 2	Meeting Room 607, Convention Center
8:00 AM – 12:00 PM	Member Symposium: Symposium in Honor of the Acarologist Carlos H. W. Flechtmann: Mite Odyssey	Meeting Room 711, Convention Center
8:00 AM – 9:40 AM	Grad 10-min: MUVE, Diptera, Mosquitoes 1	Meeting Room 302, Convention Center
8:00 AM – 9:20 AM	Grad 10-min: PBT, General Physiology 1	Meeting Room 301, Convention Center
8:00 AM – 9:30 AM	Grad 10-min: PBT, Pests and Resistance	Meeting Room 304, Convention Center
8:00 AM – 9:30 AM	Grad 10-min: P-IE, Biological Control	Meeting Room 404, Convention Center
8:00 AM – 9:40 AM	Grad 10-min: P-IE, General Ecology 1	Meeting Room 502, Convention Center
8:00 AM – 9:50 AM	Grad 10-min: P-IE, IPM, Field Crops 1	Meeting Room 403, Convention Center
8:00 AM – 9:50 AM	Grad 10-min: P-IE, IPM, Forests and General	Meeting Room 501, Convention Center
8:00 AM – 9:50 AM	Grad 10-min: P-IE, Pollination 1	Meeting Room 405, Convention Center
8:00 AM – 10:00 AM	Journal of Medical Entomology Editorial Board Meeting	Granite AB, Hyatt Regency
8:00 AM – 12:00 PM	NC1205 Monarch Butterfly Conservation	Mineral Hall F, Hyatt Regency
8:30 AM – 5:00 PM	ACE Prep Course	Meeting Room 709, Convention Center
9:00 AM – 10:00 AM	Grand Challenges Leaders Meeting	Meeting Room 608, Convention Center
10:00 AM – 11:50 AM	Grad 10-min: PBT, General Physiology 2	Meeting Room 301, Convention Center
10:00 AM – 11:40 AM	Grad 10-min: P-IE, Biocontrol Parasitoids, Pathogens, and Predators	Meeting Room 404, Convention Center
10:00 AM – 11:40 AM	Grad 10-min: P-IE, Chemical Ecology	Meeting Room 304, Convention Center
10:00 AM – 11:40 AM	Grad 10-min: P-IE, General Ecology 2	Meeting Room 502, Convention Center
10:00 AM – 11:40 AM	Grad 10-min: P-IE, General Ecology 3	Meeting Room 503, Convention Center
10:00 AM – 11:50 AM	Grad 10-min: P-IE, Invasive Species	Meeting Room 501, Convention Center
10:00 AM – 11:50 AM	Grad 10-min: P-IE, IPM, Field Crops 2	Meeting Room 403, Convention Center
10:00 AM – 11:40 AM	Grad 10-min: P-IE, Pollination 2	Meeting Room 405, Convention Center
10:00 AM – 11:40 AM	Undergrad 10-min: MUVE and PBT	Meeting Room 302, Convention Center
10:00 AM – 12:00 PM	Annals of the ESA Editorial Board Meeting	Granite AB, Hyatt Regency
10:00 AM – 11:30 AM	IOBC Governing Board Meeting	Mineral Hall G, Hyatt Regency
10:30 AM – 11:30 AM	Public Health Credentialing Task Force Meeting	Quartz, Hyatt Regency
12:00 PM – 1:30 PM	BCE Medical and Veterinary Specialty Exam Item Writing Session	Quartz, Hyatt Regency
12:15 PM – 1:15 PM	Lunch and Learn: How to Talk to a Nine-Year-Old about Climate Change (and Other Tough Concepts!) Using Informal Invertebrate Education	Meeting Room 704/706, Convention Center
12:15 PM – 1:15 PM	Lunch and Learn: To the Head of the Class: Preparing for Your First Faculty Teaching Position	Meeting Room 705/707, Convention Center
12:20 PM – 2:00 PM	NCB-ESA Executive Committee Meeting	Meeting Room 608, Convention Center
12:30 PM – 1:30 PM	Luncheon for the MUVE Section Symposium: Innovation in Research and Development of Insect Repellents	Meeting Room 404, Convention Center
12:30 PM – 2:00 PM	2017 Annual Meeting Program Committee Meeting	Meeting Room 606, Convention Center
1:00 PM – 3:00 PM	Environmental Entomology Editorial Board Meeting	Granite AB, Hyatt Regency
1:00 PM – 4:00 PM	GDM ARM New Feature Training	Mineral Hall F, Hyatt Regency

SUNDAY, NOVEMBER 5 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
1:00 PM – 3:00 PM	National Linnaean Games Preliminary Round	Four Seasons Ballroom, Convention Center
1:00 PM – 5:00 PM	NCSRP Research Planning Meeting	Mineral Hall G, Hyatt Regency
1:30 PM – 5:30 PM	Program Symposium: Grand Challenges: Tackling Invasive Species and Communication Strategies	Meeting Room 601/603, Convention Center
1:30 PM – 5:30 PM	Workshop: Ignite, Inspire, and Innovate through Education and Outreach	Meeting Room 705/707, Convention Center
1:30 PM – 5:30 PM	MUVE Section Symposium: Innovation in Research and Development of Insect Repellents	Meeting Room 404, Convention Center
1:30 PM – 5:10 PM	PBT Section Symposium: Chemical Innovation in the Insect World: How, Why, and What Next?	Meeting Room 303, Convention Center
1:30 PM – 5:30 PM	PBT Section Symposium: Combining Ecology, Evolution, and Genomics to Study Complex Insect Phenotypes	Meeting Room 304, Convention Center
1:30 PM – 5:00 PM	PBT Section Symposium: Protecting Bee Pollinators with Comparative Toxicology and Functional Genomics	Meeting Room 302, Convention Center
1:30 PM – 5:15 PM	P-IE Section Symposium: Celebrating a Centennial of Corn Borers: What Have We Learned Since the Introduction?	Meeting Room 403, Convention Center
1:30 PM – 4:50 PM	P-IE Section Symposium: Climate and Forest Insect Outbreaks: Linking Climate, Tree Physiology, and Insect Demography	Meeting Room 712, Convention Center
1:30 PM – 5:30 PM	P-IE Section Symposium: New Directions in Indirect Defense: A Continuum of Plant Control over Tri-Trophic Interactions	Meeting Room 502, Convention Center
1:30 PM – 5:30 PM	SysEB Section Symposium: Revelations from Insect Transcriptomics	Meeting Room 702, Convention Center
1:30 PM – 5:30 PM	Member Symposium: Entomology and Extension: Presenting Research Findings to Clientele	Meeting Room 501, Convention Center
1:30 PM – 5:30 PM	Member Symposium: Functional Genomics of Insects Via Targeted Genome Editing	Meeting Room 301, Convention Center
1:30 PM – 5:00 PM	Member Symposium: Innovations and Upcoming Challenges to Manage Insects in Greenhouses	Meeting Room 708, Convention Center
1:30 PM – 5:30 PM	Member Symposium: Into the Wilderness: Studies of Staphylinidae	Meeting Room 704, Convention Center
1:30 PM – 4:45 PM	Member Symposium: Psyllids and "Candidatus Liberibacter" Species: Novel Insights about These Destructive Vector-Bacteria Partnerships	Meeting Room 503, Convention Center
1:30 PM – 5:15 PM	Member Symposium: Stored-Product Entomology: Innovative Approaches for Integrated Insect Pest Management	Meeting Room 405, Convention Center
1:30 PM – 5:30 PM	Member Symposium: What's the Buzz with Industrial Hemp and Entomology?	Meeting Room 710, Convention Center
1:30 PM – 4:30 PM	Organized Meeting: Americas Neuropterists Meeting	Meeting Room 504, Convention Center
1:30 PM – 5:30 PM	Organized Meeting: Current Advances in Acarology	Meeting Room 711, Convention Center
1:30 PM – 5:30 PM	Organized Meeting: International Society of Hymenopterists Business Meeting	Meeting Room 605, Convention Center
1:30 PM – 5:30 PM	Organized Meeting: SOLA Scarab Workers	Meeting Room 607, Convention Center
1:30 PM – 3:40 PM	10-min: P-IE, Invasive Species 1	Meeting Room 507, Convention Center
1:30 PM – 5:30 PM	10-min: P-IE, IPM, Horticultural and Specialty Crops 1	Meeting Room 506, Convention Center

SUNDAY, NOVEMBER 5 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
1:30 PM – 4:30 PM	10-min: P-IE, Pollination	Meeting Room 505, Convention Center
1:30 PM – 5:30 PM	Monsanto Lygus Meeting	Meeting Room 401/402, Convention Center
2:00 PM – 5:00 PM	Certification Board Meeting	Quartz, Hyatt Regency
2:00 PM – 5:00 PM	Tour: Butterfly Pavilion	E Concourse, Convention Center
3:00 PM – 5:00 PM	Journal of Economic Entomology Editorial Board Meeting	Granite AB, Hyatt Regency
4:30 PM – 5:30 PM	10-min: P-IE, Apiculture	Meeting Room 505, Convention Center
4:30 PM – 5:30 PM	New Member Reception	Meeting Room 703, Convention Center
5:30 PM – 7:30 PM	Opening Plenary Session with Feature Speaker Mary Roach	Four Seasons Ballroom, Convention Center
7:30 PM – 9:30 PM	Highlighted Posters	Mile High Lobby, Convention Center
7:30 PM – 9:30 PM	Highlighted Virtual Posters	Mile High Lobby, Convention Center
7:30 PM – 9:30 PM	Exhibit Hall	Mile High Ballroom, Convention Center
7:30 PM – 9:30 PM	Welcome Reception	Mile High Ballroom, Convention Center

MONDAY, NOVEMBER 6

TIME	SESSION/FUNCTION	LOCATION
6:30 AM – 7:45 AM	Sunrise Session: Women in Entomology Breakfast	Altitude II, Hyatt Regency
7:00 AM – 10:00 AM	ESA Certification Exams	Meeting Room 712, Convention Center
7:00 AM – 7:30 AM	Moderator Training	Meeting Room 501, Convention Center
7:00 AM – 6:00 PM	Presentation Preview Room (PPR)/Speaker Ready Room	Meeting Room 210/212, Convention Center
7:00 AM – 5:00 PM	Registration and Information Center	E Concourse, Convention Center
7:00 AM – 5:00 PM	Student Competition Judges Break Room	Meeting Room 701, Convention Center
7:00 AM – 7:30 AM	Student Competition Judges Training	Meeting Room 502, Convention Center
7:00 AM – 1:00 PM	The Coleopterists Society Executive Council Meeting	Mineral Hall G, Hyatt Regency
7:30 AM – 12:30 PM	IRAC-US Meeting	Meeting Room 304, Convention Center
8:00 AM – 9:00 AM	Grad 3-min: All Sections 1	Four Seasons Ballroom, Convention Center
8:00 AM – 9:10 AM	Grad 10-min: MUVE, Termites and Urban Insects	Meeting Room 302, Convention Center
8:00 AM – 9:30 AM	Grad 10-min: MUVE, Ticks and Urban Pests	Meeting Room 303, Convention Center
8:00 AM – 9:20 AM	Grad 10-min: PBT, Toxicology	Meeting Room 301, Convention Center
8:00 AM – 9:00 AM	Grad 10-min: P-IE, Apiculture	Meeting Room 503, Convention Center
8:00 AM – 9:40 AM	Grad 10-min: P-IE, Biological Control, Predators	Meeting Room 501, Convention Center
8:00 AM – 9:50 AM	Grad 10-min: P-IE, Host Plant Resistance	Meeting Room 404, Convention Center
8:00 AM – 9:50 AM	Grad 10-min: P-IE, IPM, Field Crops 4	Meeting Room 405, Convention Center
8:00 AM – 9:20 AM	Grad 10-min: P-IE, IPM, Horticulture	Meeting Room 502, Convention Center
8:00 AM – 9:50 AM	Grad 10-min: SysEB, Coleoptera 1	Meeting Room 703, Convention Center
8:00 AM – 9:40 AM	Grad 10-min: SysEB, Coleoptera and Diptera	Meeting Room 709, Convention Center
8:00 AM – 9:50 AM	Grad 10-min: SysEB, Hymenoptera 1	Meeting Room 504, Convention Center
8:00 AM – 8:50 AM	Grad 10-min: SysEB, Hymenoptera and Isoptera	Meeting Room 506, Convention Center

MONDAY, NOVEMBER 6 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
8:00 AM – 9:50 AM	Grad 10-min: SysEB, Hymenoptera 3	Meeting Room 505, Convention Center
8:00 AM – 9:20 AM	Grad 10-min: SysEB, Lepidoptera	Meeting Room 711, Convention Center
8:00 AM – 9:40 AM	Undergrad 10-min: P-IE, Miscellaneous	Meeting Room 403, Convention Center
8:00 AM – 9:40 AM	Undergrad 10-min: SysEB, Miscellaneous	Meeting Room 507, Convention Center
8:00 AM – 6:30 PM	Grad Poster: MUVE, Blattodea, Hemiptera, and Others	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: MUVE, Coleoptera and Diptera	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: PBT, Araneae, Coleoptera, Hemiptera, Strepsiptera, and Scorpiones	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: PBT, Diptera	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: PBT, Hymenoptera	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: PBT, Lepidoptera	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: P-IE, Behavior	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: P-IE, Biocontrol and Parasitoids	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: P-IE, Chemical Ecology and Climate Change	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: P-IE, Ecology	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: P-IE, Honey Bees	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: P-IE, Host Plant Resistance	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: P-IE, Invasive Species	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: P-IE, IPM, Field Crops 1	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: P-IE, IPM, Field Crops 2	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: P-IE, IPM, Horticulture and Pollination	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: P-IE, Vectors of Plant Disease and Resistance Management	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: SysEB, Coleoptera	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: SysEB, Diptera and Hemiptera	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: SysEB, Hymenoptera	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Poster: SysEB, Miscellaneous	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Undergrad Poster: MUVE and PBT	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Undergrad Poster: P-IE, Apiculture, Behavior and Chemical Ecology	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Undergrad Poster: P-IE, Ecology	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Undergrad Poster: P-IE, Miscellaneous	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Undergrad Poster: SysEB, Miscellaneous	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Undergrad Poster: SysEB, Coleoptera	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Highlighted Posters	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Virtual Poster: MUVE, Ecology, Environment, and Pest Management	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Virtual Poster: P-IE, Ecology, Environment, and Pest Management	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Grad Virtual Poster: SysEB, Natural Enemies and Environment	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Undergrad Virtual Poster: MUVE, P-IE, and SysEB	Mile High Ballroom, Convention Center

MONDAY, NOVEMBER 6 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
8:00 AM – 6:30 PM	Highlighted Virtual Posters	Mile High Ballroom, Convention Center
8:00 AM – 9:30 AM	Entomological Foundation Board of Directors Meeting	Meeting Room 608, Convention Center
8:00 AM – 10:00 AM	Journal of Integrated Pest Management Editorial Board Meeting	Granite AB, Hyatt Regency
8:30 AM – 12:30 PM	Science Policy Fellows Workshop	Meeting Room 606, Convention Center
9:00 AM – 5:00 PM	Exhibit Hall	Mile High Ballroom, Convention Center
9:00 AM – 10:00 AM	Grad 3-min: All Sections 2	Four Seasons Ballroom, Convention Center
10:00 AM – 11:20 AM	Grad 10-min: MUVE, Diptera, Flies	Meeting Room 302, Convention Center
10:00 AM – 11:40 AM	Grad 10-min: MUVE, Diptera, Mosquitoes 2	Meeting Room 303, Convention Center
10:00 AM – 11:40 AM	Grad 10-min: PBT, Pollinators	Meeting Room 301, Convention Center
10:00 AM – 11:40 AM	Grad 10-min: P-IE, Behavior	Meeting Room 503, Convention Center
10:00 AM – 11:40 AM	Grad 10-min: P-IE, Biological Control, Parasitoids	Meeting Room 501, Convention Center
10:00 AM – 11:30 AM	Grad 10-min: P-IE, Chemical Ecology, Climate Change, and Ecology	Meeting Room 403, Convention Center
10:00 AM – 11:50 AM	Grad 10-min: P-IE, Invasive Species, Resistance Management, Social Insects, and Transgenic Crops	Meeting Room 404, Convention Center
10:00 AM – 11:50 AM	Grad 10-min: P-IE, IPM, Field Crops 3	Meeting Room 405, Convention Center
10:00 AM – 11:40 AM	Grad 10-min: P-IE, Vectors of Plant Diseases	Meeting Room 502, Convention Center
10:00 AM – 11:30 AM	Grad 10-min: SysEB, Acari, Araneae, Opiliones, Orthoptera, Phasmatodea, and Phthiraptera	Meeting Room 506, Convention Center
10:00 AM – 11:50 AM	Grad 10-min: SysEB, Coleoptera 2	Meeting Room 703, Convention Center
10:00 AM – 11:50 AM	Grad 10-min: SysEB, Hemiptera	Meeting Room 711, Convention Center
10:00 AM – 11:50 AM	Grad 10-min: SysEB, Hymenoptera 2	Meeting Room 504, Convention Center
10:00 AM – 11:50 AM	Grad 10-min: SysEB, Hymenoptera 4	Meeting Room 505, Convention Center
10:00 AM – 11:50 AM	Grad 10-min: SysEB, Neuroptera, Odonata, and Others	Meeting Room 709, Convention Center
10:00 AM – 12:00 PM	Arthropod Management Tests Editorial Board Meeting	Granite AB, Hyatt Regency
12:00 PM – 1:30 PM	Archives of Insect Biochemistry and Physiology Editorial Board Meeting	Quartz, Hyatt Regency
12:00 PM – 2:00 PM	Insect Biochemistry and Molecular Biology Board Meeting	Mineral Hall F, Hyatt Regency
12:15 PM – 1:30 PM	Lunch and Learn: Inspiring Science through Storytelling	Meeting Room 601/603, Convention Center
12:15 PM – 2:45 PM	Lunch and Learn: Science Policy 101 for the Entomologist	Meeting Room 705/707, Convention Center
12:15 PM – 2:45 PM	Lunch and Learn: *This Week in Science* Podcast Live Taping!	Meeting Room 605/607, Convention Center
1:00 PM – 3:15 PM	PBT Section Symposium: Pesticide Exposure Assessment for Non-*Apis* Bees: Inspiring Research for Innovative Solutions	Meeting Room 301, Convention Center
1:00 PM – 3:00 PM	P-IE Section Symposium: Novel DNA-Based Methods to Reveal Diets of Beneficial Insects	Meeting Room 703, Convention Center
1:00 PM – 3:00 PM	Member Symposium: Entomology and Entomologists at Predominantly Undergraduate Institutions: Status, Challenges, and Prospects	Meeting Room 404, Convention Center

MONDAY, NOVEMBER 6 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
1:00 PM – 3:00 PM	Member Symposium: Innovative Research on Climate Change across the USA and Latin America: 5th Latin American/Hispanic Symposium	Meeting Room 405, Convention Center
1:00 PM – 3:00 PM	Member Symposium: Phenotypic Plasticity: Cause and Consequence in Insect Sociality	Meeting Room 709, Convention Center
1:00 PM – 2:30 PM	Member Symposium: Processes that Drive the Population Dynamics of Forest Insects: Celebrating the Contributions of Professor Ken Raffa (University of Wisconsin-Madison)	Meeting Room 505, Convention Center
1:00 PM – 3:00 PM	Member Symposium: Urban Pollinator Conservation: Overcoming Challenges in a Rapidly Changing Environment	Meeting Room 506, Convention Center
1:00 PM – 2:45 PM	Senior Member Symposium with Retired, Emeriti and ESA Professionals on Ignite Passion, Inspire Collaboration and Innovate Communications and Connections	Meeting Room 711, Convention Center
1:00 PM – 3:00 PM	3-min: All Sections	Four Seasons Ballroom, Convention Center
1:00 PM – 2:30 PM	10-min: SysEB, Biology, Morphology and Systematics of Mites and Spiders	Meeting Room 402, Convention Center
1:00 PM – 2:30 PM	10-min: SysEB, Evolution and Morphology of Lepidoptera	Meeting Room 303, Convention Center
1:00 PM – 3:10 PM	10-min: SysEB, Genomics and Population Genetics	Meeting Room 403, Convention Center
1:00 PM – 2:20 PM	10-min: SysEB, Phylogeny and Evolution of Hymenoptera	Meeting Room 507, Convention Center
1:00 PM – 2:20 PM	10-min: SysEB, Systematics, Biodiversity and Genomics of Diptera	Meeting Room 304, Convention Center
1:00 PM – 3:00 PM	10-min: SysEB, Systematics and Biodiversity of the Odonata and Polyneoptera	Meeting Room 401, Convention Center
1:30 PM – 2:30 PM	P-IE Field Tour Participant Gathering: What's Next?	Meeting Room 608, Convention Center
1:30 PM – 5:30 PM	Organized Meeting: Highlights of Medical, Urban and Veterinary Entomology & MUVE Business Meeting	Meeting Room 702/704/706, Convention Center
1:30 PM – 3:30 PM	Science Policy Committee	Meeting Room 606, Convention Center
2:00 PM – 3:00 PM	ESA Committee on Common Names of Insects Meeting	Granite AB, Hyatt Regency
3:00 PM – 6:00 PM	Organized Meeting: Physiology, Biochemistry, and Toxicology (PBT) Networking Section	Meeting Room 302, Convention Center
3:00 PM – 6:00 PM	Organized Meeting: Plant-Insect Ecosystem (P-IE) Section Networking, Business, and Learning Session	Meeting Room 501/502/503/504, Convention Center
3:00 PM – 5:30 PM	Organized Meeting: Systematics, Evolution, and Biodiversity (SysEB) Section Meeting	Meeting Room 708/710/712, Convention Center
3:00 PM – 5:00 PM	Journal of Insect Science Editorial Board Meeting	Granite AB, Hyatt Regency
5:30 PM – 6:30 PM	Committee on Diversity & Inclusion-Sponsored Reception	Capitol Ballroom 1, Hyatt Regency
5:30 PM – 7:00 PM	International Association of Black Entomologists (IABE) Annual Meeting	Meeting Room 401, Convention Center
5:30 PM – 7:00 PM	Western IPM Center Bed Bug Work Group Meeting	Meeting Room 606, Convention Center
6:30 PM – 8:30 PM	Iowa State University Alumni Mixer	Mineral Hall G, Hyatt Regency
6:30 PM – 9:00 PM	PNW Mixer: Oregon State University, Montana State University, Washington State University and University of Idaho	Mineral Hall F, Hyatt Regency
6:30 PM – 8:30 PM	Purdue Entomology Mixer	Capitol Ballroom 5, Hyatt Regency
6:30 PM – 8:30 PM	The Ohio State University and Michigan State University Joint Mixer	Inspire, Hampton Inn

MONDAY, NOVEMBER 6 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
6:30 PM – 8:00 PM	University of Illinois Mixer	Brilliance, Hampton Inn
6:30 PM – 8:00 PM	University of Wisconsin Mixer	Capitol Ballroom 6, Hyatt Regency
7:00 PM – 9:00 PM	2017 Mid-Atlantic Mixer: University of Maryland, Virginia Tech, Rutgers, and University of Delaware	Meeting Room 605/607, Convention Center
7:00 PM – 9:00 PM	Auburn, Arkansas, Clemson, Kentucky and Tennessee Mixer	Meeting Room 705/707, Convention Center
7:00 PM – 9:00 PM	Kansas State University, Colorado State University, and University of Nebraska - Lincoln Mixer	Capitol Ballroom 7, Hyatt Regency
7:00 PM – 9:00 PM	Southeastern Branch ESA Mixer: Co-Sponsored by University of Georgia, North Carolina State University, and University of Florida	Capitol Ballroom 4, Hyatt Regency
7:00 PM – 9:00 PM	Texas A&M University, Oklahoma State University and Southwestern Branch Mixer	Capitol Ballroom 2/3, Hyatt Regency
7:00 PM – 9:00 PM	University of California Mixer for Students and Alumni	Meeting Room 601/603, Convention Center
8:00 PM – 10:00 PM	Cornell University Entomology Mixer-Reception	Energy, Hampton Inn
8:00 PM – 10:00 PM	Minnesota Mixer	Capitol Ballroom 1, Hyatt Regency

TUESDAY, NOVEMBER 7

TIME	SESSION/FUNCTION	LOCATION
7:00 AM – 8:00 AM	Fire Ant/ Ant Pest eXtension Network Meeting	Mineral Hall F/G, Hyatt Regency
7:00 AM – 6:00 PM	Presentation Preview Room (PPR)/Speaker Ready Room	Meeting Room 210/212, Convention Center
7:00 AM – 5:00 PM	Registration and Information Center	E Concourse, Convention Center
7:30 AM – 8:50 AM	Awards Breakfast Featuring the Founders' Memorial Lecture	Four Seasons Ballroom, Convention Center
8:00 AM – 6:30 PM	Highlighted Posters	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Poster: MUVE, Insecticides and Other Control	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Poster: PBT, Feeding and Energy Metabolism	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Poster: PBT, Physiology and Morphology	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Poster: P-IE, Behavior and Ecology 1	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Poster: P-IE, Biological Control	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Poster: P-IE, Insecticides and Other Control 1	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Poster: P-IE, Invasive Species	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Poster: P-IE, Population Dynamics	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Poster: P-IE, Semiochemicals and Trapping	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Poster: SysEB, Ecology and Disease 1	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Poster: SysEB, Structure and Function	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Highlighted Virtual Posters	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Virtual Poster: PBT	Mile High Ballroom, Convention Center
8:00 AM – 6:30 PM	Virtual Poster: SysEB	Mile High Ballroom, Convention Center
8:00 AM – 10:00 AM	Insect Systematics and Diversity Editorial Board Meeting	Granite AB, Hyatt Regency

TUESDAY, NOVEMBER 7 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
8:30 AM – 9:30 AM	School IPM Network	Mineral Hall F/G, Hyatt Regency
9:00 AM – 12:00 PM	MUVE Section Symposium: Innovations in Disease Management: Integrating Entomology and Community Engagement	Meeting Room 710/712, Convention Center
9:00 AM – 1:00 PM	PBT Section Symposium: Insecticide Science in the 21st Century: The Age of Increased Targets, Resistance, and Biorational Insecticides	Meeting Room 603, Convention Center
9:00 AM – 12:00 PM	PBT Section Symposium: Mitochondria, Metabolism, and Homeostasis: From Molecular Mechanisms to Societies	Meeting Room 301, Convention Center
9:00 AM – 11:15 AM	P-IE Section Symposium: Applied Chemical Ecology and Biocontrol for Invasive Species	Meeting Room 705, Convention Center
9:00 AM – 11:00 AM	P-IE Section Symposium: Entomological Engineering: Tracking, Stimulation, and Detection of Insects	Meeting Room 404, Convention Center
9:00 AM – 12:30 PM	P-IE Section Symposium: Finding Common Ground: Comparing Pollinator and Natural Enemy Community Responses to Land Management Practices	Meeting Room 709, Convention Center
9:00 AM – 11:00 AM	P-IE Section Symposium in Honor of Larry Larson: Crops and Pollinators: Causes of Decline and Solutions for Improving Pollinator Health and Delivering on Crop Production	Meeting Room 707, Convention Center
9:00 AM – 11:00 AM	SysEB Section Symposium: It Takes Two: Co-Evolutionary Innovation in Insect-Based Mutualisms	Meeting Room 502, Convention Center
9:00 AM – 12:15 PM	Member Symposium: Acari Come Full Circle: From Omics to Physiology and Pathogen Transmission Biology	Meeting Room 605, Convention Center
9:00 AM – 12:00 PM	Member Symposium: Arctic, Antarctic, and Alpine Invertebrates: Research from Earth's Coldest and Most Rapidly Changing Environments	Meeting Room 401, Convention Center
9:00 AM – 1:00 PM	Member Symposium: Communication at the Intersection of Urban and Forest Communities	Meeting Room 708, Convention Center
9:00 AM – 1:00 PM	Member Symposium: Genomics of Adaptation: Linking the Next Generation of Genome-Wide Analysis to Understand and Manage Complex Traits	Meeting Room 302/303, Convention Center
9:00 AM – 12:00 PM	Member Symposium: Innovative Advancements in Eradicating the Asian Longhorned Beetle	Meeting Room 703, Convention Center
9:00 AM – 11:20 AM	Member Symposium: Insect Nanocoatings: Diversity, Mechanisms, and Functions	Meeting Room 711, Convention Center
9:00 AM – 11:45 AM	Member Symposium: Pulse Crop Insect Pests and Their Management	Meeting Room 701, Convention Center
9:00 AM – 11:15 AM	Member Symposium: The Inspiring, Exploding Skeptical Movement and its Impact on Entomology	Meeting Room 405, Convention Center
9:00 AM – 11:40 AM	Member Symposium: Toys of the Behavioral and Biocontrol Trade: The Possibilities and What You Need to Start	Meeting Room 501, Convention Center
9:00 AM – 10:40 AM	10-min: MUVE, Ticks	Meeting Room 503, Convention Center
9:00 AM – 11:00 AM	10-min: MUVE, Urban Pests	Meeting Room 607, Convention Center
9:00 AM – 11:30 AM	10-min: MUVE, Veterinary Pests	Meeting Room 504, Convention Center
9:00 AM – 11:10 AM	10-min: PBT, General Physiology 1	Meeting Room 304, Convention Center
9:00 AM – 11:00 AM	10-min: PBT, Insecticide Resistance	Meeting Room 506, Convention Center
9:00 AM – 10:30 AM	10-min: PBT, Toxicology	Meeting Room 402, Convention Center

TUESDAY, NOVEMBER 7 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
9:00 AM – 12:00 PM	10-min: P-IE, Biocontrol, Parasitoids	Meeting Room 505, Convention Center
9:00 AM – 11:20 AM	10-min: P-IE, IPM, Field Crops 1	Meeting Room 403, Convention Center
9:00 AM – 10:50 AM	10-min: P-IE, Outreach and Teaching	Meeting Room 507, Convention Center
9:00 AM – 11:40 AM	10-min: SysEB, Conservation and Biodiversity	Meeting Room 704/706, Convention Center
9:00 AM – 10:30 AM	10-min: SysEB, Genetics, Behavior and Ecology of Social Insects	Meeting Room 702, Convention Center
9:00 AM – 11:20 AM	10-min: SysEB, Systematics, Biodiversity, and Biology of Ants	Meeting Room 601, Convention Center
9:00 AM – 10:00 AM	Awards Task Force Committee Meeting	Meeting Room 606, Convention Center
9:00 AM – 5:00 PM	Exhibit Hall	Mile High Ballroom, Convention Center
9:30 AM – 10:30 AM	Committee on Diversity & Inclusion Meeting	Meeting Room 608, Convention Center
9:30 AM - 1:30 AM	Entomological Foundation Board of Counselors Meeting	Quartz, Hyatt Regency
10:00 AM – 11:30 AM	American Entomologist Editorial Board Meeting	Granite AB, Hyatt Regency
10:00 AM – 11:00 AM	Awards and Honors Committee Meeting	Meeting Room 606, Convention Center
10:00 AM – 1:00 PM	Tour: Denver Museum of Nature and Science	E Concourse, Convention Center
11:00 AM – 11:30 AM	Late-Breaking Organized Meeting: ESA Briefing on the USDA Listening Session on Native Pollinator Monitoring	Meeting Room 707, Convention Center
11:00 AM – 12:30 PM	10-min: MUVE, Structural Pests	Meeting Room 607, Convention Center
11:00 AM – 12:50 PM	10-min: MUVE, Vector Control	Meeting Room 503, Convention Center
11:00 AM – 12:20 PM	10-min: P-IE, Climate Change, Climate Effects	Meeting Room 507, Convention Center
11:00 AM – 12:00 PM	Early Career Professionals Committee Meeting	Meeting Room 608, Convention Center
12:00 PM -2:00 PM	Education and Outreach Committee Meeting	Quartz, Hyatt Regency
12:00 PM – 2:00 PM	Journal of Insect Physiology	Meeting Room 606, Convention Center
12:00 PM – 1:00 PM	Past President's Lunch	Presidential Suite, Hyatt Regency
12:15 PM – 1:15 PM	Lunch and Learn: 1, 2...Eyes on You: Classroom Management, Crowd Control and How to Rock Any Outreach Presentation	Meeting Room 710/712, Convention Center
12:15 PM – 1:15 PM	Lunch and Learn: Creative Writing for Entomologists: Short Forms and Little Creatures	Meeting Room 704/706, Convention Center
12:15 PM – 1:15 PM	Lunch and Learn: ESA Publications "Ask Me Anything"	Meeting Room 703, Convention Center
12:15 PM – 1:15 PM	ESA National Insect Photo Salon	Meeting Room 402, Convention Center
12:15 PM – 1:15 PM	Society for Regulatory Entomology Annual Meeting	Meeting Room 501, Convention Center
1:00 PM – 4:00 PM	Student Debates: The Anthropocene: Implications for Arthropods and Biodiversity	Four Seasons Ballroom, Convention Center
1:30 PM – 5:30 PM	Program Symposium: Igniting the Spark: Science Communication by the Next Generation of Entomologists	Meeting Room 601, Convention Center
1:30 PM – 5:30 PM	Workshop: Insect Genome Editing: Why and How	Meeting Room 704/706, Convention Center
1:30 PM – 5:45 PM	MUVE Section Symposium: Advances in the Biology and Management of Modern Bed Bugs	Meeting Room 302/303, Convention Center
1:30 PM – 5:30 PM	MUVE Section Symposium: Resurgence of Black Flies (Diptera: Simuliidae) in the Academic and Public Arenas	Meeting Room 705, Convention Center

TUESDAY, NOVEMBER 7 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
1:30 PM – 5:30 PM	PBT Section Symposium: Fruit Flies: From Model to Management	Meeting Room 711, Convention Center
1:30 PM – 5:30 PM	PBT Section Symposium: New Directions in Evaluating Insecticidal Proteins for Safety	Meeting Room 603, Convention Center
1:30 PM – 5:30 PM	PBT Section Symposium: The Peritrophic Matrix: From Past to Future	Meeting Room 301, Convention Center
1:30 PM – 4:30 PM	P-IE Section Symposium: Igniting, Inspiring, and Influencing the Public Mind: Roles in Educating the Public on Biotechnology	Meeting Room 404, Convention Center
1:30 PM – 3:30 PM	P-IE Section Symposium: Igniting Next Generation Science on Habitat and Landscape Management to Enhance Pest Suppression and Pollination	Meeting Room 710/712, Convention Center
1:30 PM – 5:30 PM	P-IE Section Symposium: Igniting the Future of Insect Migration Research	Meeting Room 402, Convention Center
1:30 PM – 5:15 PM	P-IE Section Symposium: Interactions of Bark and Ambrosia Beetles with their Fungal Symbionts and Naive Hosts: Exploring Biological, Ecological, and Physiological Vulnerabilities	Meeting Room 702, Convention Center
1:30 PM – 5:00 PM	SysEB Section Symposium: Big Data and Bugs: How Massively Collected Biodiversity Data Are Changing the Way We Do Insect Science	Meeting Room 607, Convention Center
1:30 PM – 5:00 PM	SysEB Section Symposium: Lighting the Candle: Innovative Approaches for Illuminating Earth's Biodiversity	Meeting Room 605, Convention Center
1:30 PM – 5:30 PM	Member Symposium: Advances in Arthropod Genomics	Meeting Room 502, Convention Center
1:30 PM – 5:30 PM	Member Symposium: Breaking Down the Wall: Humans as Vectors of Invasive Species, Solutions for Research-Policy-Field Workflow, and Outbreaks	Meeting Room 501, Convention Center
1:30 PM – 5:30 PM	Member Symposium: Emerging Pathogens and Parasites of Honey Bees	Meeting Room 709, Convention Center
1:30 PM – 3:30 PM	Member Symposium: Igniting Entomological Innovation from Universities, Government, and Industry (the BCE Symposium)	Meeting Room 703, Convention Center
1:30 PM – 5:30 PM	Member Symposium: Interdisciplinary Approaches to IPM	Meeting Room 401, Convention Center
1:30 PM – 5:15 PM	Member Symposium: Orthopteroids: Innovative Organisms to Ignite and Inspire Scientific Research and Communication	Meeting Room 505, Convention Center
1:30 PM – 4:15 PM	Member Symposium: The Acarological Society of America: Acarology in the Military	Meeting Room 504, Convention Center
1:30 PM – 5:15 PM	Member Symposium: The Westward Expansion of Japanese Beetle (Popillia japonica Newman): Encounters with Regulatory Entomology	Meeting Room 701, Convention Center
1:30 PM – 2:50 PM	10-min: MUVE, Stored Products	Meeting Room 707, Convention Center
1:30 PM – 3:00 PM	10-min: MUVE, Vector Competence and Genetics	Meeting Room 403, Convention Center
1:30 PM – 4:20 PM	10-min: PBT, General Physiology 2	Meeting Room 304, Convention Center
1:30 PM – 4:30 PM	10-min: PBT, Pest Control	Meeting Room 506, Convention Center
1:30 PM – 3:30 PM	10-min: PBT, Vector Physiology	Meeting Room 405, Convention Center
1:30 PM – 3:40 PM	10-min: P-IE, Biocontrol, Predators and Pathogens	Meeting Room 708, Convention Center
1:30 PM – 4:10 PM	10-min: P-IE, IPM, Field Crops 2	Meeting Room 507, Convention Center
1:30 PM – 4:30 PM	10-min: P-IE, Vectors of Plant Disease	Meeting Room 503, Convention Center

TUESDAY, NOVEMBER 7 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
2:00 PM – 4:00 PM	ACE Support Committee - Item Writing and Review	Quartz, Hyatt Regency
2:00 PM – 3:00 PM	Branch Leaders Meeting	Meeting Room 606, Convention Center
3:00 PM – 6:00 PM	ESA Publications Council Meeting	Granite AB, Hyatt Regency
3:00 PM – 4:00 PM	Presidential Committee on Section Leadership	Meeting Room 608, Convention Center
3:30 PM – 5:30 PM	Organized Meeting: International Branch Meeting	Meeting Room 707, Convention Center
3:30 PM – 4:50 PM	10-min: MUVE, Vector Behavior and Physiology	Meeting Room 403, Convention Center
3:30 PM – 5:00 PM	10-min: PBT, Pollinators	Meeting Room 405, Convention Center
3:30 PM – 5:00 PM	Certification Reception	Meeting Room 703, Convention Center
4:00 PM – 5:00 PM	Association of Indian Entomologists in North America (AIENA) Annual Meeting	Meeting Room 708, Convention Center
4:00 PM – 5:30 PM	BCE Core Exam Item Writing Session	Quartz, Hyatt Regency
4:00 PM – 7:30 PM	Organized Meeting: IOBC Business Meeting and Mixer	Meeting Room 710/712, Convention Center
4:30 PM – 5:30 PM	ESA/EPA-OPP SmartLabel Database Update Committee Meeting	Meeting Room 606, Convention Center
5:00 PM – 6:30 PM	National Linnaean Games Competition Final Round	Four Seasons Ballroom, Convention Center
5:15 PM – 7:30 PM	Closing Reception for Insect Migration Symposium	Meeting Room 402, Convention Center
5:30 PM – 6:30 PM	Global Locust Initiative: Open Forum and Discussion for New Interdisciplinary & Cross-Sectoral Initiative at ASU	Meeting Room 608, Convention Center
6:30 PM – 8:00 PM	Student Awards Ceremony	Four Seasons Ballroom, Convention Center
7:00 PM – 8:00 PM	ESA Editors Reception	Capitol Ballroom 3, Hyatt Regency
8:00 PM – 10:00 PM	Organized Meeting: IUSSI North American Section Business Meeting	Meeting Room 504, Convention Center
8:00 PM – 10:30 PM	Organized Meeting: Korean Young Entomologists (KYE)	Meeting Room 709, Convention Center
8:00 PM – 10:00 PM	Organized Meeting: North American Dipterists Society (NADS) Meeting	Meeting Room 505, Convention Center
8:00 PM – 10:00 PM	Organized Meeting: Overseas Chinese Entomologist Association (OCEA): Progress Report and Student Competition in 2017	Meeting Room 503, Convention Center
8:00 PM – 10:00 PM	Organized Meeting: Society of Overseas Nepalese Entomologists Meeting	Meeting Room 707, Convention Center
8:00 PM – 10:00 PM	Organized Meeting: The Coleopterists Society Annual General Meeting	Meeting Room 607, Convention Center
8:00 PM – 9:00 PM	Governing Board Reception	Capitol Ballroom 1/2, Hyatt Regency
8:00 PM – 11:00 PM	Student Reception	Wynkoop Brewery
10:30 PM – 11:30 PM	Korean Young Entomologists (KYE) Mixer	Meeting Room 709, Convention Center

WEDNESDAY, NOVEMBER 8

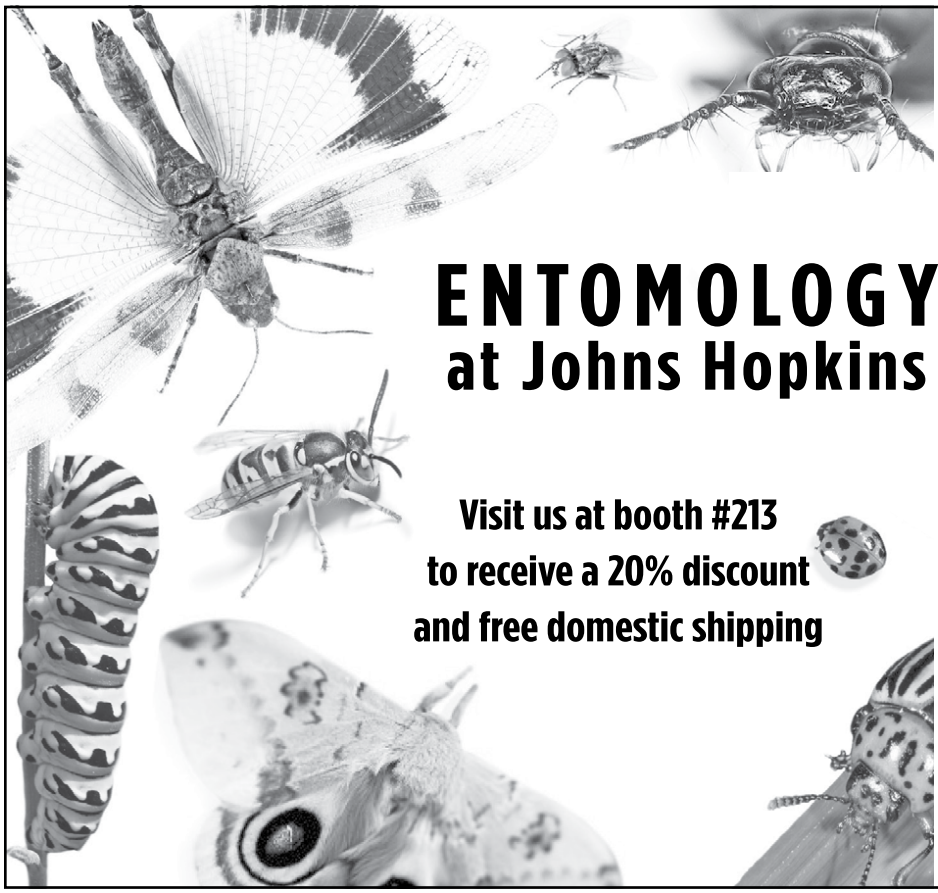
TIME	SESSION/FUNCTION	LOCATION
6:30 AM – 7:45 AM	Sunrise Session: Igniting School Staff and Student Interest in IPM through Innovation	Meeting Room 703, Convention Center
6:30 AM – 7:45 AM	Sunrise Session: USDA-APHIS-BRS and EPA Training on Permitting for Genetically Engineered Insects	Meeting Room 705, Convention Center

WEDNESDAY, NOVEMBER 8 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
6:45 AM – 8:00 AM	Open P-IE Section Governing Council and Member Feedback Session	Meeting Room 606, Convention Center
6:45 AM – 7:45 AM	PBT Final Business Meeting	Meeting Room 301, Convention Center
7:00 AM – 9:00 AM	MUVE Final Business Meeting with Breakfast	Meeting Room 712, Convention Center
7:00 AM – 12:00 PM	Presentation Preview Room (PPR)/Speaker Ready Room	Meeting Room 210/212
7:00 AM – 12:00 PM	Registration and Information Center	E Concourse, Convention Center
8:00 AM – 11:15 AM	Program Symposium: Igniting Cross Disciplinarity, Inspiring Novel Research, and Innovating Solutions to the World's Biggest Killers: Ecological and Evolutionary Perspectives of Biodiversity in the Mosquitoes	Meeting Room 601, Convention Center
8:00 AM – 11:45 AM	Program Symposium: The Power of Cooperation: Collaborations that Facilitate Advancements in Science	Meeting Room 607, Convention Center
8:00 AM – 12:00 PM	Workshop: Promulgate Your Passion: Techniques to Create, Engage, and Communicate Science	Meeting Room 703, Convention Center
8:00 AM – 12:00 PM	PBT Section Symposium: Chemical Ecology of Cerambycid Beetles: Basic Science and Practical Applications	Meeting Room 402, Convention Center
8:00 AM – 12:00 PM	PBT Section Symposium: Efficacy and Durability of RNAi and RNAi Traits	Meeting Room 301, Convention Center
8:00 AM – 12:00 PM	P-IE Section Symposium: Ecology in the Sixth Mass Extinction: Detecting and Understanding Rare Biotic Interactions	Meeting Room 711, Convention Center
8:00 AM – 11:15 AM	P-IE Section Symposium: Integrated Pest Management of Tropical Crops	Meeting Room 707, Convention Center
8:00 AM – 11:40 AM	P-IE Section Symposium: Understanding the Host-Vector-Pathogen Interactions Involved in Citrus Greening Disease: Advances in Vector and Disease Control	Meeting Room 403, Convention Center
8:00 AM – 12:00 PM	SysEB Section Symposium: Integrative and Comparative Approaches to Understanding the Evolution of Social Behavior	Meeting Room 502, Convention Center
8:00 AM – 11:30 AM	Member Symposium: Applying Emerging Genomic Techniques to Control Invasive Species	Meeting Room 704, Convention Center
8:00 AM – 11:40 AM	Member Symposium: Aquatic Entomology: Innovative Strategies in Research, Education, and Outreach	Meeting Room 708, Convention Center
8:00 AM – 11:50 AM	Member Symposium: Insects: It's What's for Dinner!	Meeting Room 706, Convention Center
8:00 AM – 11:50 AM	Member Symposium: Pollinator Nutrition: Lessons from Bees at Individual to Landscape Levels	Meeting Room 501, Convention Center
8:00 AM – 11:40 AM	Member Symposium: Systematics and Evolution of the Tenebrionoidea (Coleoptera)	Meeting Room 506, Convention Center
8:00 AM – 12:00 PM	Organized Meeting: WERA 1021: Multi-State Research Collaborations Inspire Spotted Wing Drosophila, Drosophila suzukii, Management Innovations	Meeting Room 702, Convention Center
8:00 AM – 11:20 AM	10-min: MUVE, Vector Surveillance	Meeting Room 503, Convention Center
8:00 AM – 10:30 AM	10-min: P-IE, Behavior	Meeting Room 504, Convention Center
8:00 AM – 11:00 AM	10-min: P-IE, Biocontrol, General	Meeting Room 507, Convention Center
8:00 AM – 11:20 AM	10-min: P-IE, Host Plant Resistance	Meeting Room 710, Convention Center
8:00 AM – 10:50 AM	10-min: P-IE, Invasive Species 2	Meeting Room 705, Convention Center
8:00 AM – 11:00 AM	10-min: P-IE, Resistance Management	Meeting Room 405, Convention Center

WEDNESDAY, NOVEMBER 8 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
8:00 AM – 11:30 AM	10-min: SysEB, Systematics and Biodiversity of Coleoptera	Meeting Room 505, Convention Center
8:00 AM – 9:50 AM	10-min: SysEB, Systematics and Biology of Hemiptera and Their Endosymbionts	Meeting Room 603, Convention Center
8:00 AM – 10:00 AM	10-min: SysEB, Systematics, Biodiversity, & Conservation of Bees	Meeting Room 401, Convention Center
8:00 AM – 2:00 PM	Highlighted Posters	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Poster: MUVE, Behavior and Ecology	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Poster: MUVE, Genetics and Morphology	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Poster: PBT, Insecticides and Other Control	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Poster: P-IE, Behavior and Ecology 2	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Poster: P-IE, Host Plant and Pathogen Interactions	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Poster: P-IE, Insecticides and Other Control 2	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Poster: P-IE, Pollinators	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Poster: P-IE, Technology and Outreach	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Poster: SysEB, Ecology and Disease 2	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Poster: SysEB, Identification and Outreach	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Highlighted Virtual Posters	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Virtual Poster: MUVE	Mile High Ballroom, Convention Center
8:00 AM – 2:00 PM	Virtual Poster: P-IE	Mile High Ballroom, Convention Center
8:00 AM – 9:00 AM	Exhibitor Breakfast: What You Need to Know about Shipping to Canada	Mile High Ballroom (Exhibitor Lounge), Convention Center
8:00 AM – 11:30 AM	Governing Board Meeting	Mineral Hall F/G, Hyatt Regency
9:00 AM – 11:00 AM	MUVE Section Symposium: The Challenge of Tick-borne Diseases	Meeting Room 404, Convention Center
9:00 AM – 11:15 AM	P-IE Section Symposium: New Tools and Tactics to Manage Insecticide Resistance	Meeting Room 709, Convention Center
9:00 AM – 11:45 AM	SysEB Section Symposium: Breaking into the Biobank: Promising Methods for Sequencing DNA from Museum Arthropod Specimens	Meeting Room 605, Convention Center
9:00 AM – 2:00 PM	Exhibit Hall	Mile High Ballroom, Convention Center
9:00 AM – 12:00 PM	Tour: Butterfly Pavilion	E Concourse, Convention Center
10:00 AM – 12:00 PM	MUVE Section Symposium: DoD-Funded Research to Transform Ideas into Products	Meeting Room 302/303, Convention Center
11:30 AM – 12:30 PM	Student Affairs Committee Meeting	Meeting Room 606, Convention Center
12:00 PM – 2:00 PM	Current Opinion in Insect Science	Meeting Room 608, Convention Center
12:15 PM – 1:30 PM	Closing Plenary Session	Four Seasons Ballroom, Convention Center
1:30 PM – 5:30 PM	Workshop: Making the Switch: A Beginner's Guide to R for Those Familiar with Other Packages	Meeting Room 705, Convention Center
1:30 PM – 3:30 PM	Late-Breaking MUVE Section Symposium: Invasion and Subsequent Eradication of Screwworm in Florida (2016-2017)	Meeting Room 712, Convention Center
1:30 PM – 3:30 PM	MUVE Section Symposium: Vector Management Using Consumer Products	Meeting Room 710, Convention Center



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WEDNESDAY, NOVEMBER 8 – CONTINUED

TIME	SESSION/FUNCTION	LOCATION
1:30 PM – 3:30 PM	PBT Section Symposium: Insect Genome Data Management: Progress and Perspectives	Meeting Room 301, Convention Center
1:30 PM – 3:30 PM	P-IE Section Symposium: Inspiring a New Cadre of Vegetable Specialists By Sharing Expertise Related to Piercing-Sucking Insects of Economic Importance in Vegetable Production	Meeting Room 706, Convention Center
1:30 PM – 3:30 PM	P-IE Section Symposium: Leveraging Non-Traditional Uses of Microbial Control Agents for Broad Application in Crop Production and Protection	Meeting Room 704, Convention Center
1:30 PM – 3:30 PM	Member Symposium: Chemical Ecology in the New Era of Technology	Meeting Room 603, Convention Center
1:30 PM – 3:30 PM	Member Symposium: Demographic and Behavioral Responses of Insects to Disturbance	Meeting Room 707, Convention Center
1:30 PM – 3:30 PM	Member Symposium: Innovative Sunflower Insect Pest Management	Meeting Room 701, Convention Center
1:30 PM – 3:50 PM	Member Symposium: Insect Eggs: Ecology, Morphology, and Applied Entomology	Meeting Room 708, Convention Center
1:30 PM – 3:55 PM	Member Symposium: Insect Microclimates in a Changing World	Meeting Room 302/303, Convention Center
1:30 PM – 3:30 PM	Member Symposium: International Collaboration in Entomology: Successes and Challenges	Meeting Room 709, Convention Center
1:30 PM – 3:30 PM	Member Symposium: The Challenges of Effective Vector Control at the Intersection of Science, Policy, and Communications	Meeting Room 402, Convention Center
1:30 PM – 3:30 PM	Organized Meeting: International Aphid Genomics Consortium	Meeting Room 601, Convention Center
1:30 PM – 3:30 PM	Organized Meeting: Lessons Learned from the March for Science	Meeting Room 605, Convention Center
1:30 PM – 4:10 PM	10-min: P-IE, Chemical Ecology	Meeting Room 711, Convention Center
1:30 PM – 5:30 PM	10-min: P-IE, Ecology, General	Meeting Room 702, Convention Center
1:30 PM – 4:40 PM	10-min: P-IE, IPM, Horticultural and Specialty Crops 2	Meeting Room 607, Convention Center
2:30 PM – 4:30 PM	2018 Joint Annual Meeting Program Committee Meeting	Meeting Room 608, Convention Center
2:30 PM – 3:30 PM	SysEB Final Business Meeting	Meeting Room 703, Convention Center

5 GREAT WAYS TO BUILD THE FUTURE OF ENTOMOLOGY...

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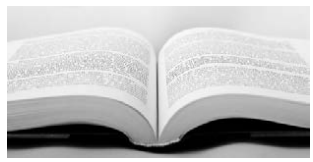

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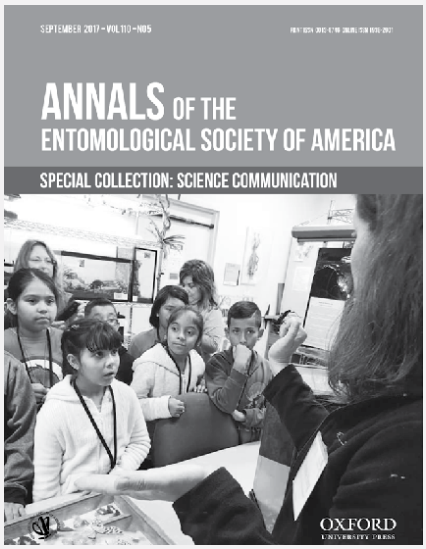
SUNDAY, NOVEMBER 5

SESSION/FUNCTION	TIME	LOCATION
PLENARY		
Opening Plenary Session with Feature Speaker Mary Roach	5:30 PM – 7:30 PM	Four Seasons Ballroom, Convention Center
PROGRAM SYMPOSIA		
Grand Challenges: Tackling Invasive Species and Communication Strategies	1:30 PM – 5:30 PM	Meeting Room 601/603, Convention Center
WORKSHOPS		
Ignite, Inspire, and Innovate through Education and Outreach	1:30 PM – 5:30 PM	Meeting Room 705/707, Convention Center
SECTION SYMPOSIA		
MUVE Section Symposium: Innovation in Research and Development of Insect Repellents	1:30 PM – 5:30 PM	Meeting Room 404, Convention Center
PBT Section Symposium: Chemical Innovation in the Insect World: How, Why, and What Next?	1:30 PM – 5:10 PM	Meeting Room 303, Convention Center
PBT Section Symposium: Combining Ecology, Evolution, and Genomics to Study Complex Insect Phenotypes	1:30 PM – 5:30 PM	Meeting Room 304, Convention Center
PBT Section Symposium: Protecting Bee Pollinators with Comparative Toxicology and Functional Genomics	1:30 PM – 5:00 PM	Meeting Room 302, Convention Center
P-IE Section Symposium: Celebrating a Centennial of Corn Borers: What Have We Learned Since the Introduction?	1:30 PM – 5:15 PM	Meeting Room 403, Convention Center
P-IE Section Symposium: Climate and Forest Insect Outbreaks: Linking Climate, Tree Physiology, and Insect Demography	1:30 PM – 4:50 PM	Meeting Room 712, Convention Center
P-IE Section Symposium: New Directions in Indirect Defense: A Continuum of Plant Control over Tri-Trophic Interactions	1:30 PM – 5:30 PM	Meeting Room 502, Convention Center
SysEB Section Symposium: Revelations from Insect Transcriptomics	1:30 PM – 5:30 PM	Meeting Room 702, Convention Center
MEMBER SYMPOSIA		
Symposium in Honor of the Acarologist Carlos H. W. Flechtmann: Mite Odyssey	8:00 AM – 12:00 PM	Meeting Room 711, Convention Center
Entomology and Extension: Presenting Research Findings to Clientele	1:30 PM – 5:30 PM	Meeting Room 501, Convention Center
Functional Genomics of Insects Via Targeted Genome Editing	1:30 PM – 5:30 PM	Meeting Room 301, Convention Center
Innovations and Upcoming Challenges to Manage Insects in Greenhouses	1:30 PM – 5:00 PM	Meeting Room 708, Convention Center
Into the Wilderness: Studies of Staphylinidae	1:30 PM – 5:30 PM	Meeting Room 704, Convention Center
Psyllids and “Candidatus Liberibacter” Species: Novel Insights about These Destructive Vector-Bacteria Partnerships	1:30 PM – 4:45 PM	Meeting Room 503, Convention Center
Stored-Product Entomology: Innovative Approaches for Integrated Insect Pest Management	1:30 PM – 5:15 PM	Meeting Room 405, Convention Center



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SUNDAY, NOVEMBER 5 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
What's the Buzz with Industrial Hemp and Entomology?	1:30 PM – 5:30 PM	Meeting Room 710, Convention Center

ORGANIZED MEETINGS

Americas Neuropterists Meeting	1:30 PM – 4:30 PM	Meeting Room 504, Convention Center
Current Advances in Acarology	1:30 PM – 5:30 PM	Meeting Room 711, Convention Center
International Society of Hymenopterists Business Meeting	1:30 PM – 5:30 PM	Meeting Room 605, Convention Center
SOLA Scarab Workers	1:30 PM – 5:30 PM	Meeting Room 607, Convention Center

SUNRISE SESSIONS

Achieving Success as a Mentor Through Implementation of Effective Mentoring Strategies	6:30 AM – 7:45 AM	Meeting Room 705/707, Convention Center
"Bugs on Bugs": An Inquiry-Based, Collaborative Activity to Illustrate the Diversity of Arthropods and their Symbionts	6:30 AM – 7:45 AM	Meeting Room 704/706, Convention Center

LUNCH AND LEARNS

How to Talk to a Nine-Year-Old about Climate Change (and Other Tough Concepts!) Using Informal Invertebrate Education	12:15 PM – 1:15 PM	Meeting Room 704/706, Convention Center
To the Head of the Class: Preparing for Your First Faculty Teaching Position	12:15 PM – 1:15 PM	Meeting Room 705/707, Convention Center

STUDENT TEN MINUTE PAPER (TMP) COMPETITION

Grad 10-min: MUVE, Diptera, Mosquitoes 1	8:00 AM – 9:40 AM	Meeting Room 302, Convention Center
Grad 10-min: PBT, General Physiology 1	8:00 AM – 9:20 AM	Meeting Room 301, Convention Center
Grad 10-min: PBT, Pests and Resistance	8:00 AM – 9:30 AM	Meeting Room 304, Convention Center
Grad 10-min: P-IE, Biological Control	8:00 AM – 9:30 AM	Meeting Room 404, Convention Center
Grad 10-min: P-IE, General Ecology 1	8:00 AM – 9:40 AM	Meeting Room 502, Convention Center
Grad 10-min: P-IE, IPM, Field Crops 1	8:00 AM – 9:50 AM	Meeting Room 403, Convention Center
Grad 10-min: P-IE, IPM, Forests and General	8:00 AM – 9:50 AM	Meeting Room 501, Convention Center
Grad 10-min: P-IE, Pollination 1	8:00 AM – 9:50 AM	Meeting Room 405, Convention Center
Grad 10-min: PBT, General Physiology 2	10:00 AM – 11:50 AM	Meeting Room 301, Convention Center
Grad 10-min: P-IE, Biocontrol Parasitoids, Pathogens, and Predators	10:00 AM – 11:40 AM	Meeting Room 404, Convention Center
Grad 10-min: P-IE, Chemical Ecology	10:00 AM – 11:40 AM	Meeting Room 304, Convention Center
Grad 10-min: P-IE, General Ecology 2	10:00 AM – 11:40 AM	Meeting Room 502, Convention Center
Grad 10-min: P-IE, General Ecology 3	10:00 AM – 11:40 AM	Meeting Room 503, Convention Center
Grad 10-min: P-IE, Invasive Species	10:00 AM – 11:50 AM	Meeting Room 501, Convention Center
Grad 10-min: P-IE, IPM, Field Crops 2	10:00 AM – 11:50 AM	Meeting Room 403, Convention Center
Grad 10-min: P-IE, Pollination 2	10:00 AM – 11:40 AM	Meeting Room 405, Convention Center
Undergrad 10-min: MUVE and PBT	10:00 AM – 11:40 AM	Meeting Room 302, Convention Center

SUNDAY, NOVEMBER 5 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
TEN MINUTE PAPER (TMP) ORAL		
10-min: P-IE, Invasive Species 1	1:30 PM – 3:40 PM	Meeting Room 507, Convention Center
10-min: P-IE, IPM, Horticultural and Specialty Crops 1	1:30 PM – 5:30 PM	Meeting Room 506, Convention Center
10-min: P-IE, Pollination	1:30 PM – 4:30 PM	Meeting Room 505, Convention Center
10-min: P-IE, Apiculture	4:30 PM – 5:30 PM	Meeting Room 505, Convention Center
POSTERS		
Highlighted Posters	7:30 PM – 9:30 PM	Mile High Lobby, Convention Center
VIRTUAL POSTERS		
Highlighted Virtual Posters	7:30 PM – 9:30 PM	Mile High Lobby, Convention Center

MONDAY, NOVEMBER 6

SESSION/FUNCTION	TIME	LOCATION
SECTION SYMPOSIA		
PBT Section Symposium: Pesticide Exposure Assessment for Non-*Apis* Bees: Inspiring Research for Innovative Solutions	1:00 PM – 3:15 PM	Meeting Room 301, Convention Center
P-IE Section Symposium: Novel DNA-Based Methods to Reveal Diets of Beneficial Insects	1:00 PM – 3:00 PM	Meeting Room 703, Convention Center
MEMBER SYMPOSIA		
Entomology and Entomologists at Predominantly Undergraduate Institutions: Status, Challenges, and Prospects	1:00 PM – 3:00 PM	Meeting Room 404, Convention Center
Innovative Research on Climate Change across the USA and Latin America: 5th Latin American/Hispanic Symposium	1:00 PM – 3:00 PM	Meeting Room 405, Convention Center
Phenotypic Plasticity: Cause and Consequence in Insect Sociality	1:00 PM – 3:00 PM	Meeting Room 709, Convention Center
Processes that Drive the Population Dynamics of Forest Insects: Celebrating the Contributions of Professor Ken Raffa (University of Wisconsin-Madison)	1:00 PM – 2:30 PM	Meeting Room 505, Convention Center
Urban Pollinator Conservation: Overcoming Challenges in a Rapidly Changing Environment	1:00 PM – 3:00 PM	Meeting Room 506, Convention Center
Senior Member Symposium with Retired, Emeriti and ESA Professionals on Ignite Passion, Inspire Collaboration and Innovate Communications and Connections	1:00 PM – 2:45 PM	Meeting Room 711, Convention Center
ORGANIZED MEETINGS		
Highlights of Medical, Urban and Veterinary Entomology & MUVE Business Meeting	1:30 PM – 5:30 PM	Meeting Room 702/704/706, Convention Center
Physiology, Biochemistry, and Toxicology (PBT) Networking Section	3:00 PM – 6:00 PM	Meeting Room 302, Convention Center

MONDAY, NOVEMBER 6 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
Plant-Insect Ecosystem (P-IE) Section Networking, Business, and Learning Session	3:00 PM – 6:00 PM	Meeting Room 501/502/503/504, Convention Center
Systematics, Evolution, and Biodiversity (SysEB) Section Meeting	3:00 PM – 5:30 PM	Meeting Room 708/710/712, Convention Center
SUNRISE SESSIONS		
Women in Entomology Breakfast	6:30 AM – 7:45 AM	Altitude II, Hyatt Regency
LUNCH AND LEARNS		
Inspiring Science through Storytelling	12:15 PM – 1:30 PM	Meeting Room 601/603, Convention Center
Science Policy 101 for the Entomologist	12:15 PM – 2:45 PM	Meeting Room 705/707, Convention Center
This Week in Science Podcast Live Taping!	12:15 PM – 2:45 PM	Meeting Room 605/607, Convention Center
STUDENT THREE-MINUTE LIGHTNING BUG TALK COMPETITION		
Grad 3-min: All Sections 1	8:00 AM – 9:00 AM	Four Seasons Ballroom, Convention Center
Grad 3-min: All Sections 2	9:00 AM – 10:00 AM	Four Seasons Ballroom, Convention Center
THREE-MINUTE LIGHTNING BUG TALKS		
3-min: All Sections	1:00 PM – 3:00 PM	Four Seasons Ballroom, Convention Center
STUDENT TMP COMPETITION		
Grad 10-min: MUVE, Termites and Urban Insects	8:00 AM – 9:10 AM	Meeting Room 302, Convention Center
Grad 10-min: MUVE, Ticks and Urban Pests	8:00 AM – 9:30 AM	Meeting Room 303, Convention Center
Grad 10-min: PBT, Toxicology	8:00 AM – 9:20 AM	Meeting Room 301, Convention Center
Grad 10-min: P-IE, Apiculture	8:00 AM – 9:00 AM	Meeting Room 503, Convention Center
Grad 10-min: P-IE, Biological Control, Predators	8:00 AM – 9:40 AM	Meeting Room 501, Convention Center
Grad 10-min: P-IE, Host Plant Resistance	8:00 AM – 9:50 AM	Meeting Room 404, Convention Center
Grad 10-min: P-IE, IPM, Field Crops 4	8:00 AM – 9:50 AM	Meeting Room 405, Convention Center
Grad 10-min: P-IE, IPM, Horticulture	8:00 AM – 9:20 AM	Meeting Room 502, Convention Center
Grad 10-min: SysEB, Coleoptera 1	8:00 AM – 9:50 AM	Meeting Room 703, Convention Center
Grad 10-min: SysEB, Coleoptera and Diptera	8:00 AM – 9:40 AM	Meeting Room 709, Convention Center
Grad 10-min: SysEB, Hymenoptera 1	8:00 AM – 9:50 AM	Meeting Room 504, Convention Center
Grad 10-min: SysEB, Hymenoptera 3	8:00 AM – 9:50 AM	Meeting Room 505, Convention Center
Grad 10-min: SysEB, Hymenoptera and Isoptera	8:00 AM – 8:50 AM	Meeting Room 506, Convention Center
Grad 10-min: SysEB, Lepidoptera	8:00 AM – 9:20 AM	Meeting Room 711, Convention Center
Undergrad 10-min: P-IE, Miscellaneous	8:00 AM – 9:40 AM	Meeting Room 403, Convention Center

MONDAY, NOVEMBER 6 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
Undergrad 10-min: SysEB, Miscellaneous	8:00 AM – 9:40 AM	Meeting Room 507, Convention Center
Grad 10-min: MUVE, Diptera, Flies	10:00 AM – 11:20 AM	Meeting Room 302, Convention Center
Grad 10-min: MUVE, Diptera, Mosquitoes 2	10:00 AM – 11:40 AM	Meeting Room 303, Convention Center
Grad 10-min: PBT, Pollinators	10:00 AM – 11:40 AM	Meeting Room 301, Convention Center
Grad 10-min: P-IE, Behavior	10:00 AM – 11:40 AM	Meeting Room 503, Convention Center
Grad 10-min: P-IE, Biological Control, Parasitoids	10:00 AM – 11:40 AM	Meeting Room 501, Convention Center
Grad 10-min: P-IE, Chemical Ecology, Climate Change, and Ecology	10:00 AM – 11:30 AM	Meeting Room 403, Convention Center
Grad 10-min: P-IE, Invasive Species, Resistance Management, Social Insects, and Transgenic Crops	10:00 AM – 11:50 AM	Meeting Room 404, Convention Center
Grad 10-min: P-IE, IPM, Field Crops 3	10:00 AM – 11:50 AM	Meeting Room 405, Convention Center
Grad 10-min: P-IE, Vectors of Plant Diseases	10:00 AM – 11:40 AM	Meeting Room 502, Convention Center
Grad 10-min: SysEB, Acari, Araneae, Opiliones, Orthoptera, Phasmatodea, and Phthiraptera	10:00 AM – 11:30 AM	Meeting Room 506, Convention Center
Grad 10-min: SysEB, Coleoptera 2	10:00 AM – 11:50 AM	Meeting Room 703, Convention Center
Grad 10-min: SysEB, Hemiptera	10:00 AM – 11:50 AM	Meeting Room 711, Convention Center
Grad 10-min: SysEB, Hymenoptera 2	10:00 AM – 11:50 AM	Meeting Room 504, Convention Center
Grad 10-min: SysEB, Hymenoptera 4	10:00 AM – 11:50 AM	Meeting Room 505, Convention Center
Grad 10-min: SysEB, Neuroptera, Odonata, and Others	10:00 AM – 11:50 AM	Meeting Room 709, Convention Center

TEN MINUTE PAPER (TMP) ORAL

10-min: SysEB, Biology, Morphology and Systematics of Mites and Spiders	1:00 PM – 2:30 PM	Meeting Room 402, Convention Center
10-min: SysEB, Evolution and Morphology of Lepidoptera	1:00 PM – 2:30 PM	Meeting Room 303, Convention Center
10-min: SysEB, Genomics and Population Genetics	1:00 PM – 3:10 PM	Meeting Room 403, Convention Center
10-min: SysEB, Phylogeny and Evolution of Hymenoptera	1:00 PM – 2:20 PM	Meeting Room 507, Convention Center
10-min: SysEB, Systematics, Biodiversity and Genomics of Diptera	1:00 PM – 2:20 PM	Meeting Room 304, Convention Center
10-min: SysEB, Systematics and Biodiversity of the Odonata and Polyneoptera	1:00 PM – 3:00 PM	Meeting Room 401, Convention Center

STUDENT POSTER COMPETITION

Grad Poster: MUVE, Blattodea, Hemiptera, and Others	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: MUVE, Coleoptera and Diptera	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: PBT, Araneae, Coleoptera, Hemiptera, Strepsiptera, and Scorpiones	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: PBT, Diptera	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: PBT, Hymenoptera	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: PBT, Lepidoptera	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center

MONDAY, NOVEMBER 6 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
Grad Poster: P-IE, Behavior	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: P-IE, Biocontrol and Parasitoids	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: P-IE, Chemical Ecology and Climate Change	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: P-IE, Ecology	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: P-IE, Honey Bees	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: P-IE, Host Plant Resistance	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: P-IE, Invasive Species	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: P-IE, IPM, Field Crops 1	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: P-IE, IPM, Field Crops 2	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: P-IE, IPM, Horticulture and Pollination	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: P-IE, Vectors of Plant Disease and Resistance Management	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: SysEB, Coleoptera	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: SysEB, Diptera and Hemiptera	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: SysEB, Hymenoptera	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Poster: SysEB, Miscellaneous	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Undergrad Poster: MUVE and PBT	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Undergrad Poster: P-IE, Apiculture, Behavior and Chemical Ecology	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Undergrad Poster: P-IE, Ecology	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Undergrad Poster: P-IE, Miscellaneous	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Undergrad Poster: SysEB, Coleoptera	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Undergrad Poster: SysEB, Miscellaneous	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center

POSTERS

Highlighted Posters	8:00 AM – 6:30 PM	Mile High Lobby, Convention Center

STUDENT VIRTUAL POSTER COMPETITION

Grad Virtual Poster: MUVE, Ecology, Environment, and Pest Management	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Virtual Poster: P-IE, Ecology, Environment, and Pest Management	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Grad Virtual Poster: SysEB, Natural Enemies and Environment	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Undergrad Virtual Poster: MUVE, P-IE, and SysEB	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center

VIRTUAL POSTERS

Highlighted Virtual Posters	8:00 AM – 6:30 PM	Mile High Lobby, Convention Center

TUESDAY, NOVEMBER 7

SESSION/FUNCTION	TIME	LOCATION
PLENARY		
Awards Breakfast Featuring the Founders' Memorial Lecture	7:30 AM – 8:50 AM	Four Seasons Ballroom, Convention Center
Student Awards Ceremony	6:30 PM – 8:00 PM	Four Seasons Ballroom, Convention Center
PROGRAM SYMPOSIA		
Igniting the Spark: Science Communication by the Next Generation of Entomologists	1:30 PM – 5:30 PM	Meeting Room 601, Convention Center
WORKSHOPS		
Insect Genome Editing: Why and How	1:30 PM – 5:30 PM	Meeting Room 704/706, Convention Center
SECTION SYMPOSIA		
MUVE Section Symposium: Innovations in Disease Management: Integrating Entomology and Community Engagement	9:00 AM – 12:00 PM	Meeting Room 710/712, Convention Center
PBT Section Symposium: Insecticide Science in the 21st Century: The Age of Increased Targets, Resistance, and Biorational Insecticides	9:00 AM – 1:00 PM	Meeting Room 603, Convention Center
PBT Section Symposium: Mitochondria, Metabolism, and Homeostasis: From Molecular Mechanisms to Societies	9:00 AM – 12:00 PM	Meeting Room 301, Convention Center
P-IE Section Symposium: Applied Chemical Ecology and Biocontrol for Invasive Species	9:00 AM – 11:15 AM	Meeting Room 705, Convention Center
P-IE Section Symposium: Entomological Engineering: Tracking, Stimulation, and Detection of Insects	9:00 AM – 11:00 AM	Meeting Room 404, Convention Center
P-IE Section Symposium: Finding Common Ground: Comparing Pollinator and Natural Enemy Community Responses to Land Management Practices	9:00 AM – 12:30 PM	Meeting Room 709, Convention Center
P-IE Section Symposium in Honor of Larry Larson: Crops and Pollinators: Causes of Decline and Solutions for Improving Pollinator Health and Delivering on Crop Production	9:00 AM – 11:00 AM	Meeting Room 707, Convention Center
SysEB Section Symposium: It Takes Two: Co-Evolutionary Innovation in Insect-Based Mutualisms	9:00 AM – 11:00 AM	Meeting Room 502, Convention Center
MUVE Section Symposium: Advances in the Biology and Management of Modern Bed Bugs	1:30 PM – 5:45 PM	Meeting Room 302/303, Convention Center
MUVE Section Symposium: Resurgence of Black Flies (Diptera: Simuliidae) in the Academic and Public Arenas	1:30 PM – 5:30 PM	Meeting Room 705, Convention Center
PBT Section Symposium: Fruit Flies: From Model to Management	1:30 PM – 5:30 PM	Meeting Room 711, Convention Center
PBT Section Symposium: New Directions in Evaluating Insecticidal Proteins for Safety	1:30 PM – 5:30 PM	Meeting Room 603, Convention Center
PBT Section Symposium: The Peritrophic Matrix: From Past to Future	1:30 PM – 5:30 PM	Meeting Room 301, Convention Center

TUESDAY, NOVEMBER 7 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
P-IE Section Symposium: Igniting, Inspiring, and Influencing the Public Mind: Roles in Educating the Public on Biotechnology	1:30 PM – 4:30 PM	Meeting Room 404, Convention Center
P-IE Section Symposium: Igniting Next Generation Science on Habitat and Landscape Management to Enhance Pest Suppression and Pollination	1:30 PM – 3:30 PM	Meeting Room 710/712, Convention Center
P-IE Section Symposium: Igniting the Future of Insect Migration Research	1:30 PM – 5:30 PM	Meeting Room 402, Convention Center
P-IE Section Symposium: Interactions of Bark and Ambrosia Beetles with their Fungal Symbionts and Naive Hosts: Exploring Biological, Ecological, and Physiological Vulnerabilities	1:30 PM – 5:15 PM	Meeting Room 702, Convention Center
SysEB Section Symposium: Big Data and Bugs: How Massively Collected Biodiversity Data Are Changing the Way We Do Insect Science	1:30 PM – 5:00 PM	Meeting Room 607, Convention Center
SysEB Section Symposium: Lighting the Candle: Innovative Approaches for Illuminating Earth's Biodiversity	1:30 PM – 5:00 PM	Meeting Room 605, Convention Center

MEMBER SYMPOSIA

Acari Come Full Circle: From Omics to Physiology and Pathogen Transmission Biology	9:00 AM – 12:15 PM	Meeting Room 605, Convention Center
Arctic, Antarctic, and Alpine Invertebrates: Research from Earth's Coldest and Most Rapidly Changing Environments	9:00 AM – 12:00 PM	Meeting Room 401, Convention Center
Communication at the Intersection of Urban and Forest Communities	9:00 AM – 1:00 PM	Meeting Room 708, Convention Center
Genomics of Adaptation: Linking the Next Generation of Genome-Wide Analysis to Understand and Manage Complex Traits	9:00 AM – 1:00 PM	Meeting Room 302/303, Convention Center
Innovative Advancements in Eradicating the Asian Longhorned Beetle	9:00 AM – 12:00 PM	Meeting Room 703, Convention Center
Insect Nanocoatings: Diversity, Mechanisms, and Functions	9:00 AM – 11:20 AM	Meeting Room 711, Convention Center
Pulse Crop Insect Pests and Their Management	9:00 AM – 11:45 AM	Meeting Room 701, Convention Center
The Inspiring, Exploding Skeptical Movement and its Impact on Entomology	9:00 AM – 11:15 AM	Meeting Room 405, Convention Center
Toys of the Behavioral and Biocontrol Trade: The Possibilities and What You Need to Start	9:00 AM – 11:40 AM	Meeting Room 501, Convention Center
Advances in Arthropod Genomics	1:30 PM – 5:30 PM	Meeting Room 502, Convention Center
Breaking Down the Wall: Humans as Vectors of Invasive Species, Solutions for Research-Policy-Field Workflow, and Outbreaks	1:30 PM – 5:30 PM	Meeting Room 501, Convention Center
Emerging Pathogens and Parasites of Honey Bees	1:30 PM – 5:30 PM	Meeting Room 709, Convention Center
Igniting Entomological Innovation from Universities, Government, and Industry (the BCE Symposium)	1:30 PM – 3:30 PM	Meeting Room 703, Convention Center
Interdisciplinary Approaches to IPM	1:30 PM – 5:30 PM	Meeting Room 401, Convention Center
Orthopteroids: Innovative Organisms to Ignite and Inspire Scientific Research and Communication	1:30 PM – 5:15 PM	Meeting Room 505, Convention Center

TUESDAY, NOVEMBER 7 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
The Acarological Society of America: Acarology in the Military	1:30 PM – 4:15 PM	Meeting Room 504, Convention Center
The Westward Expansion of Japanese Beetle (Popillia japonica Newman): Encounters with Regulatory Entomology	1:30 PM – 5:15 PM	Meeting Room 701, Convention Center

ORGANIZED MEETINGS

Late-Breaking Organized Meeting: ESA Briefing on the USDA Listening Session on Native Pollinator Monitoring	11:00 AM – 11:30 AM	Meeting Room 707, Convention Center
Student Debates: The Anthropocene: Implications for Arthropods and Biodiversity	1:00 PM – 4:00 PM	Four Seasons Ballroom, Convention Center
International Branch Meeting	3:30 PM – 5:30 PM	Meeting Room 707, Convention Center
IOBC Business Meeting and Mixer	4:00 PM – 7:30 PM	Meeting Room 710/712, Convention Center
IUSSI North American Section Business Meeting	8:00 PM – 10:00 PM	Meeting Room 504, Convention Center
Korean Young Entomologists (KYE)	8:00 PM – 10:30 PM	Meeting Room 709, Convention Center
North American Dipterists Society (NADS) Meeting	8:00 PM – 10:00 PM	Meeting Room 505, Convention Center
Overseas Chinese Entomologist Association (OCEA): Progress Report and Student Competition in 2017	8:00 PM – 10:00 PM	Meeting Room 503, Convention Center
Society of Overseas Nepalese Entomologists Meeting	8:00 PM – 10:00 PM	Meeting Room 707, Convention Center
The Coleopterists Society Annual General Meeting	8:00 PM – 10:00 PM	Meeting Room 607, Convention Center

LUNCH AND LEARNS

1, 2...Eyes on You: Classroom Management, Crowd Control and How to Rock Any Outreach Presentation	12:15 PM – 1:15 PM	Meeting Room 710/712, Convention Center
Creative Writing for Entomologists: Short Forms and Little Creatures	12:15 PM – 1:15 PM	Meeting Room 704/706, Convention Center
ESA Publications “Ask Me Anything”	12:15 PM – 1:15 PM	Meeting Room 703, Convention Center

TEN MINUTE PAPER (TMP) ORAL

10-min: MUVE, Ticks	9:00 AM – 10:40 AM	Meeting Room 503, Convention Center
10-min: MUVE, Urban Pests	9:00 AM – 11:00 AM	Meeting Room 607, Convention Center
10-min: MUVE, Veterinary Pests	9:00 AM – 11:30 AM	Meeting Room 504, Convention Center
10-min: PBT, General Physiology 1	9:00 AM – 11:10 AM	Meeting Room 304, Convention Center
10-min: PBT, Insecticide Resistance	9:00 AM – 11:00 AM	Meeting Room 506, Convention Center
10-min: PBT, Toxicology	9:00 AM – 10:30 AM	Meeting Room 402, Convention Center
10-min: P-IE, Biocontrol, Parasitoids	9:00 AM – 12:00 PM	Meeting Room 505, Convention Center
10-min: P-IE, IPM, Field Crops 1	9:00 AM – 11:20 AM	Meeting Room 403, Convention Center
10-min: P-IE, Outreach and Teaching	9:00 AM – 10:50 AM	Meeting Room 507, Convention Center
10-min: SysEB, Conservation and Biodiversity	9:00 AM – 11:40 AM	Meeting Room 704/706, Convention Center

TUESDAY, NOVEMBER 7 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
10-min: SysEB, Genetics, Behavior and Ecology of Social Insects	9:00 AM – 10:30 AM	Meeting Room 702, Convention Center
10-min: SysEB, Systematics, Biodiversity, and Biology of Ants	9:00 AM – 11:20 AM	Meeting Room 601, Convention Center
10-min: MUVE, Structural Pests	11:00 AM – 12:30 PM	Meeting Room 607, Convention Center
10-min: MUVE, Vector Control	11:00 AM – 12:50 PM	Meeting Room 503, Convention Center
10-min: P-IE, Climate Change, Climate Effects	11:00 AM – 12:20 PM	Meeting Room 507, Convention Center
10-min: MUVE, Stored Products	1:30 PM – 2:50 PM	Meeting Room 707, Convention Center
10-min: MUVE, Vector Competence and Genetics	1:30 PM – 3:00 PM	Meeting Room 403, Convention Center
10-min: PBT, General Physiology 2	1:30 PM – 4:20 PM	Meeting Room 304, Convention Center
10-min: PBT, Pest Control	1:30 PM – 4:30 PM	Meeting Room 506, Convention Center
10-min: PBT, Vector Physiology	1:30 PM – 3:30 PM	Meeting Room 405, Convention Center
10-min: P-IE, Biocontrol, Predators and Pathogens	1:30 PM – 3:40 PM	Meeting Room 708, Convention Center
10-min: P-IE, IPM, Field Crops 2	1:30 PM – 4:10 PM	Meeting Room 507, Convention Center
10-min: P-IE, Vectors of Plant Disease	1:30 PM – 4:30 PM	Meeting Room 503, Convention Center
10-min: MUVE, Vector Behavior and Physiology	3:30 PM – 4:50 PM	Meeting Room 403, Convention Center
10-min: PBT, Pollinators	3:30 PM – 5:00 PM	Meeting Room 405, Convention Center

POSTERS

Highlighted Posters	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
MUVE, Insecticides and Other Control	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
PBT, Feeding and Energy Metabolism	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
PBT, Physiology and Morphology	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
P-IE, Behavior and Ecology 1	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
P-IE, Biological Control	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
P-IE, Insecticides and Other Control 1	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
P-IE, Invasive Species	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
P-IE, Population Dynamics	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
P-IE, Semiochemicals and Trapping	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
SysEB, Ecology and Disease 1	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
SysEB, Structure and Function	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center

VIRTUAL POSTERS

Highlighted Virtual Posters	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Virtual Poster: PBT	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center
Virtual Poster: SysEB	8:00 AM – 6:30 PM	Mile High Ballroom, Convention Center

WEDNESDAY, NOVEMBER 8

SESSION/FUNCTION	TIME	LOCATION
PLENARY		
Closing Plenary Session	12:15 PM – 1:30 PM	Four Seasons Ballroom, Convention Center
PROGRAM SYMPOSIA		
Igniting Cross Disciplinarity, Inspiring Novel Research, and Innovating Solutions to the World's Biggest Killers: Ecological and Evolutionary Perspectives of Biodiversity in the Mosquitoes	8:00 AM – 11:15 AM	Meeting Room 601, Convention Center
The Power of Cooperation: Collaborations that Facilitate Advancements in Science	8:00 AM – 11:45 AM	Meeting Room 607, Convention Center
WORKSHOPS		
Promulgate Your Passion: Techniques to Create, Engage, and Communicate Science	8:00 AM – 12:00 PM	Meeting Room 703, Convention Center
Making the Switch: A Beginner's Guide to R for Those Familiar with Other Packages	1:30 PM – 5:30 PM	Meeting Room 705, Convention Center
SECTION SYMPOSIA		
PBT Section Symposium: Chemical Ecology of Cerambycid Beetles: Basic Science and Practical Applications	8:00 AM – 12:00 PM	Meeting Room 402, Convention Center
PBT Section Symposium: Efficacy and Durability of RNAi and RNAi Traits	8:00 AM – 12:00 PM	Meeting Room 301, Convention Center
P-IE Section Symposium: Ecology in the Sixth Mass Extinction: Detecting and Understanding Rare Biotic Interactions	8:00 AM – 12:00 PM	Meeting Room 711, Convention Center
P-IE Section Symposium: Integrated Pest Management of Tropical Crops	8:00 AM – 11:15 AM	Meeting Room 707, Convention Center
P-IE Section Symposium: Understanding the Host-Vector-Pathogen Interactions Involved in Citrus Greening Disease: Advances in Vector and Disease Control	8:00 AM – 11:40 AM	Meeting Room 403, Convention Center
SysEB Section Symposium: Integrative and Comparative Approaches to Understanding the Evolution of Social Behavior	8:00 AM – 12:00 PM	Meeting Room 502, Convention Center
MUVE Section Symposium: The Challenge of Tick-borne Diseases	9:00 AM – 11:00 AM	Meeting Room 404, Convention Center
P-IE Section Symposium: New Tools and Tactics to Manage Insecticide Resistance	9:00 AM – 11:15 AM	Meeting Room 709, Convention Center
SysEB Section Symposium: Breaking into the Biobank: Promising Methods for Sequencing DNA from Museum Arthropod Specimens	9:00 AM – 11:45 AM	Meeting Room 605, Convention Center
MUVE Section Symposium: DoD-Funded Research to Transform Ideas into Products	10:00 AM – 12:00 PM	Meeting Room 302/303, Convention Center
Late-Breaking MUVE Section Symposium: Invasion and Subsequent Eradication of Screwworm in Florida (2016-2017)	1:30 PM – 3:30 PM	Meeting Room 712, Convention Center

WEDNESDAY, NOVEMBER 8 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
MUVE Section Symposium: Vector Management Using Consumer Products	1:30 PM – 3:30 PM	Meeting Room 710, Convention Center
PBT Section Symposium: Insect Genome Data Management: Progress and Perspectives	1:30 PM – 3:30 PM	Meeting Room 301, Convention Center
P-IE Section Symposium: Inspiring a New Cadre of Vegetable Specialists By Sharing Expertise Related to Piercing-Sucking Insects of Economic Importance in Vegetable Production	1:30 PM – 3:30 PM	Meeting Room 706, Convention Center
P-IE Section Symposium: Leveraging Non-Traditional Uses of Microbial Control Agents for Broad Application in Crop Production and Protection	1:30 PM – 3:30 PM	Meeting Room 704, Convention Center

MEMBER SYMPOSIA

Applying Emerging Genomic Techniques to Control Invasive Species	8:00 AM – 11:30 AM	Meeting Room 704, Convention Center
Aquatic Entomology: Innovative Strategies in Research, Education, and Outreach	8:00 AM – 11:40 AM	Meeting Room 708, Convention Center
Insects: It's What's for Dinner!	8:00 AM – 11:50 AM	Meeting Room 706, Convention Center
Pollinator Nutrition: Lessons from Bees at Individual to Landscape Levels	8:00 AM – 11:50 AM	Meeting Room 501, Convention Center
Systematics and Evolution of the Tenebrionoidea (Coleoptera)	8:00 AM – 11:40 AM	Meeting Room 506, Convention Center
Chemical Ecology in the New Era of Technology	1:30 PM – 3:30 PM	Meeting Room 603, Convention Center
Demographic and Behavioral Responses of Insects to Disturbance	1:30 PM – 3:30 PM	Meeting Room 707, Convention Center
Innovative Sunflower Insect Pest Management	1:30 PM – 3:30 PM	Meeting Room 701, Convention Center
Insect Eggs: Ecology, Morphology, and Applied Entomology	1:30 PM – 3:50 PM	Meeting Room 708, Convention Center
Insect Microclimates in a Changing World	1:30 PM – 3:55 PM	Meeting Room 302/303, Convention Center
International Collaboration in Entomology: Successes and Challenges	1:30 PM – 3:30 PM	Meeting Room 709, Convention Center
The Challenges of Effective Vector Control at the Intersection of Science, Policy, and Communications	1:30 PM – 3:30 PM	Meeting Room 402, Convention Center

ORGANIZED MEETINGS

WERA 1021: Multi-State Research Collaborations Inspire Spotted Wing Drosophila, Drosophila suzukii, Management Innovations	8:00 AM – 12:00 PM	Meeting Room 702, Convention Center
International Aphid Genomics Consortium	1:30 PM – 3:30 PM	Meeting Room 601, Convention Center
Lessons Learned from the March for Science	1:30 PM – 3:30 PM	Meeting Room 605, Convention Center

SUNRISE SESSIONS

Igniting School Staff and Student Interest in IPM through Innovation	6:30 AM – 7:45 AM	Meeting Room 703, Convention Center
USDA-APHIS-BRS and EPA Training on Permitting for Genetically Engineered Insects	6:30 AM – 7:45 AM	Meeting Room 705, Convention Center

WEDNESDAY, NOVEMBER 8 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
TEN MINUTE PAPER (TMP) ORAL		
10-min: MUVE, Vector Surveillance	8:00 AM – 11:20 AM	Meeting Room 503, Convention Center
10-min: P-IE, Behavior	8:00 AM – 10:30 AM	Meeting Room 504, Convention Center
10-min: P-IE, Biocontrol, General	8:00 AM – 11:00 AM	Meeting Room 507, Convention Center
10-min: P-IE, Host Plant Resistance	8:00 AM – 11:20 AM	Meeting Room 710, Convention Center
10-min: P-IE, Invasive Species 2	8:00 AM – 10:50 AM	Meeting Room 705, Convention Center
10-min: P-IE, Resistance Management	8:00 AM – 11:00 AM	Meeting Room 405, Convention Center
10-min: SysEB, Systematics and Biodiversity of Coleoptera	8:00 AM – 11:30 AM	Meeting Room 505, Convention Center
10-min: SysEB, Systematics and Biology of Hemiptera and Their Endosymbionts	8:00 AM – 9:50 AM	Meeting Room 603, Convention Center
10-min: SysEB, Systematics, Biodiversity, & Conservation of Bees	8:00 AM – 10:00 AM	Meeting Room 401, Convention Center
10-min: P-IE, Chemical Ecology	1:30 PM – 4:10 PM	Meeting Room 711, Convention Center
10-min: P-IE, Ecology, General	1:30 PM – 5:30 PM	Meeting Room 702, Convention Center
10-min: P-IE, IPM, Horticultural and Specialty Crops 2	1:30 PM – 4:40 PM	Meeting Room 607, Convention Center
POSTERS		
Highlighted Posters	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
MUVE, Behavior and Ecology	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
MUVE, Genetics and Morphology	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
PBT, Insecticides and Other Control	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
P-IE, Behavior and Ecology 2	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
P-IE, Host Plant and Pathogen Interactions	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
P-IE, Insecticides and Other Control 2	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
P-IE, Pollinators	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
P-IE, Technology and Outreach	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
SysEB, Ecology and Disease 2	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
SysEB, Identification and Outreach	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
VIRTUAL POSTERS		
Highlighted Virtual Posters	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
Virtual Poster: MUVE	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
Virtual Poster: P-IE	8:00 AM – 2:00 PM	Mile High Ballroom, Convention Center

FRIDAY, NOVEMBER 3

SESSION/FUNCTION	TIME	LOCATION
Annual Review of Entomology Editorial Committee Meeting	8:00 AM – 5:00 PM	Quartz, Hyatt Regency
CAMTech IAB Meeting	6:00 PM – 9:00 PM	Meeting Room 401/402, Convention Center

SATURDAY, NOVEMBER 4

SESSION/FUNCTION	TIME	LOCATION
CAMTech Full Day IAB Meeting	7:30 AM – 5:00 PM	Meeting Room 401/402, Convention Center
Certification Corporation & Governing Board Meeting	7:30 AM – 2:00 PM	Mineral Hall F/G, Hyatt Regency
Entomological Collections Network	8:00 AM – 6:00 PM	Meeting Room 607, Convention Center
S_Temp2018: The Working Group on Improving Microbial Control of Arthropod Pests	8:00 AM – 5:00 PM	Meeting Room 606, Convention Center
STEMbugs Educator Workshop	10:00 AM – 2:00 PM	Meeting Room 301/302/303, Convention Center
Tour: Fun in the Foothills	12:00 PM – 5:00 PM	E Concourse, Convention Center
Moderator Training	2:00 PM – 2:30 PM	Meeting Room 501, Convention Center
Council of Entomological Department Administrators Meeting	3:00 PM – 6:00 PM	Centennial H, Hyatt Regency
Presentation Preview Room (PPR)/Speaker Ready Room	3:00 PM – 6:00 PM	Meeting Room 210/212, Convention Center
Registration and Information Center	3:00 PM – 6:00 PM	E Concourse, Convention Center
Student Competition Judges Training	3:00 PM – 3:30 PM	Meeting Room 502, Convention Center
P-IE Section Governing Council Meeting	3:30 PM – 5:00 PM	Mineral Hall F/G, Hyatt Regency
Section Governing Council Meeting	5:00 PM – 7:00 PM	Centennial G, Hyatt Regency
Entomological Collections Network Dinner	7:00 PM – 9:00 PM	Meeting Room 603/605, Convention Center

SUNDAY, NOVEMBER 5

SESSION/FUNCTION	TIME	LOCATION
The Lightning Bug Run	6:00 AM – 8:00 AM	E Concourse, Convention Center
Moderator Training	7:00 AM – 7:30 AM	Meeting Room 501, Convention Center
Presentation Preview Room (PPR)/Speaker Ready Room	7:00 AM – 6:00 PM	Meeting Room 210/212, Convention Center
Registration and Information Center	7:00 AM – 9:00 PM	E Concourse, Convention Center
Student Competition Judges Break Room	7:00 AM – 5:00 PM	Meeting Room 701, Convention Center
Student Competition Judges Training	7:00 AM – 7:30 AM	Meeting Room 502, Convention Center
USDA - ARS All Hands Meeting	7:00 AM – 7:50 AM	Meeting Room 303, Convention Center
CAMTech Sunday Morning IAB Meeting	7:30 AM – 12:00 PM	Meeting Room 401/402, Convention Center
Entomological Collections Network Day 2	7:30 AM – 12:00 PM	Meeting Room 607, Convention Center
Journal of Medical Entomology Editorial Board Meeting	8:00 AM – 10:00 AM	Granite AB, Hyatt Regency
NC1205 Monarch Butterfly Conservation	8:00 AM – 12:00 PM	Mineral Hall F, Hyatt Regency

SUNDAY, NOVEMBER 5 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
ACE Prep Course	8:30 AM – 5:00 PM	Meeting Room 709, Convention Center
Grand Challenges Leaders Meeting	9:00 AM – 10:00 AM	Meeting Room 608, Convention Center
Annals of the ESA Editorial Board Meeting	10:00 AM – 12:00 PM	Granite AB, Hyatt Regency
IOBC Governing Board Meeting	10:00 AM – 11:30 AM	Mineral Hall G, Hyatt Regency
Public Health Credentialing Task Force Meeting	10:30 AM – 11:30 AM	Quartz, Hyatt Regency
BCE Medical and Veterinary Specialty Exam Item Writing Session	12:00 PM – 1:30 PM	Quartz, Hyatt Regency
NCB-ESA Executive Committee Meeting	12:20 PM – 2:00 PM	Meeting Room 608, Convention Center
Luncheon for the MUVE Section Symposium: Innovation in Research and Development of Insect Repellents	12:30 PM – 1:30 PM	Meeting Room 404, Convention Center
2017 Annual Meeting Program Committee Meeting	12:30 PM – 2:00 PM	Meeting Room 606, Convention Center
Environmental Entomology Editorial Board Meeting	1:00 PM – 3:00 PM	Granite AB, Hyatt Regency
GDM ARM New Feature Training	1:00 PM – 4:00 PM	Mineral Hall F, Hyatt Regency
National Linnaean Games Preliminary Round	1:00 PM – 3:00 PM	Four Seasons Ballroom, Convention Center
NCSRP Research Planning Meeting	1:00 PM – 5:00 PM	Mineral Hall G, Hyatt Regency
Monsanto Lygus Meeting	1:30 PM – 5:30 PM	Meeting Room 401/402, Convention Center
Certification Board Meeting	2:00 PM – 5:00 PM	Quartz, Hyatt Regency
Tour: Butterfly Pavilion	2:00 PM – 5:00 PM	E Concourse, Convention Center
Journal of Economic Entomology Editorial Board Meeting	3:00 PM – 5:00 PM	Granite AB, Hyatt Regency
New Member Reception	4:30 PM – 5:30 PM	Meeting Room 703, Convention Center
Opening Plenary Session with Feature Speaker Mary Roach	5:30 PM – 7:30 PM	Four Seasons Ballroom, Convention Center
Exhibit Hall	7:30 PM – 9:30 PM	Mile High Ballroom, Convention Center
Welcome Reception	7:30 PM – 9:30 PM	Mile High Ballroom, Convention Center

MONDAY, NOVEMBER 6

SESSION/FUNCTION	TIME	LOCATION
ESA Certification Exams	7:00 AM – 10:00 AM	Meeting Room 712, Convention Center
Moderator Training	7:00 AM – 7:30 AM	Meeting Room 501, Convention Center
Presentation Preview Room (PPR)/Speaker Ready Room	7:00 AM – 6:00 PM	Meeting Room 210/212, Convention Center
Registration and Information Center	7:00 AM – 5:00 PM	E Concourse, Convention Center
Student Competition Judges Break Room	7:00 AM – 5:00 PM	Meeting Room 701, Convention Center
Student Competition Judges Training	7:00 AM – 7:30 AM	Meeting Room 502, Convention Center
The Coleopterists Society Executive Council Meeting	7:00 AM – 1:00 PM	Mineral Hall G, Hyatt Regency
IRAC-US Meeting	7:30 AM – 12:30 PM	Meeting Room 304, Convention Center
Entomological Foundation Board of Directors Meeting	8:00 AM – 9:30 AM	Meeting Room 608, Convention Center
Journal of Integrated Pest Management Editorial Board Meeting	8:00 AM – 10:00 AM	Granite AB, Hyatt Regency
Science Policy Fellows Workshop	8:30 AM – 12:30 PM	Meeting Room 606, Convention Center
Exhibit Hall	9:00 AM – 5:00 PM	Mile High Ballroom, Convention Center

MONDAY, NOVEMBER 6 – CONTINUED

SESSION/FUNCTION	TIME	LOCATION
Arthropod Management Tests Editorial Board Meeting	10:00 AM – 12:00 PM	Granite AB, Hyatt Regency
Archives of Insect Biochemistry and Physiology Editorial Board Meeting	12:00 PM – 1:30 PM	Quartz, Hyatt Regency
Insect Biochemistry and Molecular Biology Board Meeting	12:00 PM – 2:00 PM	Mineral Hall F, Hyatt Regency
Science Policy Committee	1:30 PM – 3:30 PM	Meeting Room 606, Convention Center
P-IE Field Tour Participant Gathering: What's Next?	1:30 PM – 2:30 PM	Meeting Room 608, Convention Center
ESA Committee on Common Names of Insects Meeting	2:00 PM – 3:00 PM	Granite AB, Hyatt Regency
Journal of Insect Science Editorial Board Meeting	3:00 PM – 5:00 PM	Granite AB, Hyatt Regency
Committee on Diversity & Inclusion-Sponsored Reception	5:30 PM – 6:30 PM	Capitol Ballroom 1, Hyatt Regency
International Association of Black Entomologists (IABE) Annual Meeting	5:30 PM – 7:00 PM	Meeting Room 401, Convention Center
Western IPM Center Bed Bug Work Group Meeting	5:30 PM – 7:00 PM	Meeting Room 606, Convention Center
Iowa State University Alumni Mixer	6:30 PM – 8:30 PM	Mineral Hall G, Hyatt Regency
PNW Mixer: Oregon State University, Montana State University, Washington State University and University of Idaho	6:30 PM – 9:00 PM	Mineral Hall F, Hyatt Regency
Purdue Entomology Mixer	6:30 PM – 8:30 PM	Capitol Ballroom 5, Hyatt Regency
The Ohio State University and Michigan State University Joint Mixer	6:30 PM – 8:30 PM	Inspire, Hampton Inn
University of Illinois Mixer	6:30 PM – 8:00 PM	Brilliance, Hampton Inn
University of Wisconsin Mixer	6:30 PM – 8:00 PM	Capitol Ballroom 6, Hyatt Regency
2017 Mid-Atlantic Mixer: University of Maryland, Virginia Tech, Rutgers, and University of Delaware	7:00 PM – 9:00 PM	Meeting Room 605/607, Convention Center
Auburn, Arkansas, Clemson, Kentucky and Tennessee Mixer	7:00 PM – 9:00 PM	Meeting Room 705/707, Convention Center
Kansas State University, Colorado State University, and University of Nebraska - Lincoln Mixer	7:00 PM – 9:00 PM	Capitol Ballroom 7, Hyatt Regency
Southeastern Branch ESA Mixer: Co-Sponsored by University of Georgia, North Carolina State University, and University of Florida	7:00 PM – 9:00 PM	Capitol Ballroom 4, Hyatt Regency
Texas A&M University, Oklahoma State University and Southwestern Branch Mixer	7:00 PM – 9:00 PM	Capitol Ballroom 2/3, Hyatt Regency
University of California Mixer for Students and Alumni	7:00 PM – 9:00 PM	Meeting Room 601/603, Convention Center
Cornell University Entomology Mixer-Reception	8:00 PM – 10:00 PM	Energy, Hampton Inn
Minnesota Mixer	8:00 PM – 10:00 PM	Capitol Ballroom 1, Hyatt Regency

TUESDAY, NOVEMBER 7

SESSION/FUNCTION	TIME	LOCATION
Fire Ant/ Ant Pest eXtension Network Meeting	7:00 AM – 8:00 AM	Mineral Hall F/G, Hyatt Regency
Presentation Preview Room (PPR)/Speaker Ready Room	7:00 AM – 6:00 PM	Meeting Room 210/212, Convention Center
Registration and Information Center	7:00 AM – 5:00 PM	E Concourse, Convention Center
Awards Breakfast Featuring the Founders' Memorial Lecture	7:30 AM – 8:50 AM	Four Seasons Ballroom, Convention Center
Insect Systematics and Diversity Editorial Board Meeting	8:00 AM – 10:00 AM	Granite AB, Hyatt Regency
School IPM Network	8:30 AM – 9:30 AM	Mineral Hall F/G, Hyatt Regency
Awards Task Force Committee Meeting	9:00 AM – 10:00 AM	Meeting Room 606, Convention Center
Exhibit Hall	9:00 AM – 5:00 PM	Mile High Ballroom, Convention Center
Committee on Diversity & Inclusion Meeting	9:30 AM – 10:30 AM	Meeting Room 608, Convention Center
Entomological Foundation Board of Counselors Meeting	9:30 AM - 11:30 AM	Quartz, Hyatt Regency
American Entomologist Editorial Board Meeting	10:00 AM – 11:30 AM	Granite AB, Hyatt Regency
Awards and Honors Committee Meeting	10:00 AM – 11:00 AM	Meeting Room 606, Convention Center
Tour: Denver Museum of Nature and Science	10:00 AM – 1:00 PM	E Concourse, Convention Center
Early Career Professionals Committee Meeting	11:00 AM – 12:00 PM	Meeting Room 608, Convention Center
Education and Outreach Committee Meeting	12:00 PM - 2:00 PM	Quartz, Hyatt Regency
Journal of Insect Physiology	12:00 PM – 2:00 PM	Meeting Room 606, Convention Center
Past President's Lunch	12:00 PM – 1:00 PM	Presidential Suite, Hyatt Regency
ESA National Insect Photo Salon	12:15 PM – 1:15 PM	Meeting Room 402, Convention Center
Society for Regulatory Entomology Annual Meeting	12:15 PM – 1:15 PM	Meeting Room 501, Convention Center
ACE Support Committee - Item Writing and Review	2:00 PM – 4:00 PM	Quartz, Hyatt Regency
Branch Leaders Meeting	2:00 PM – 3:00 PM	Meeting Room 606, Convention Center
ESA Publications Council Meeting	3:00 PM – 6:00 PM	Granite AB, Hyatt Regency
Presidential Committee on Section Leadership	3:00 PM – 4:00 PM	Meeting Room 608, Convention Center
Certification Reception	3:30 PM – 5:00 PM	Meeting Room 703, Convention Center
Association of Indian Entomologists in North America (AIENA) Annual Meeting	4:00 PM – 5:00 PM	Meeting Room 708, Convention Center
BCE Core Exam Item Writing Session	4:00 PM – 5:30 PM	Quartz, Hyatt Regency
ESA/EPA-OPP SmartLabel Database Update Committee Meeting	4:30 PM – 5:30 PM	Meeting Room 606, Convention Center
National Linnaean Games Competition Final Round	5:00 PM – 6:30 PM	Four Seasons Ballroom, Convention Center
Closing Reception for Insect Migration Symposium	5:15 PM – 7:30 PM	Meeting Room 402, Convention Center
Global Locust Initiative: Open Forum and Discussion for New Interdisciplinary & Cross-Sectoral Initiative at ASU	5:30 PM – 6:30 PM	Meeting Room 608, Convention Center
Student Awards Ceremony	6:30 PM – 8:00 PM	Four Seasons Ballroom, Convention Center
ESA Editors Reception	7:00 PM – 8:00 PM	Capitol Ballroom 3, Hyatt Regency
Governing Board Reception	8:00 PM – 9:00 PM	Capitol Ballroom 1/2, Hyatt Regency
Student Reception	8:00 PM – 11:00 PM	Wynkoop Brewery
Korean Young Entomologists (KYE) Mixer	10:30 PM – 11:30 PM	Meeting Room 709, Convention Center

WEDNESDAY, NOVEMBER 8

SESSION/FUNCTION	TIME	LOCATION
Open P-IE Section Governing Council and Member Feedback Session	6:45 AM – 8:00 AM	Meeting Room 606, Convention Center
PBT Final Business Meeting	6:45 AM – 7:45 AM	Meeting Room 301, Convention Center
MUVE Final Business Meeting with Breakfast	7:00 AM – 9:00 AM	Meeting Room 712, Convention Center
Presentation Preview Room (PPR)/Speaker Ready Room	7:00 AM – 12:00 PM	Meeting Room 210/212, Convention Center
Registration and Information Center	7:00 AM – 12:00 PM	E Concourse, Convention Center
Exhibitor Breakfast: What You Need to Know about Shipping to Canada	8:00 AM – 9:00 AM	Mile High Ballroom (Exhibitor Lounge), Convention Center
Governing Board Meeting	8:00 AM – 11:30 AM	Mineral Hall F/G, Hyatt Regency
Exhibit Hall	9:00 AM – 2:00 PM	Mile High Ballroom, Convention Center
Tour: Butterfly Pavilion	9:00 AM – 12:00 PM	E Concourse, Convention Center
Student Affairs Committee Meeting	11:30 AM – 12:30 PM	Meeting Room 606, Convention Center
Current Opinion in Insect Science	12:00 PM – 2:00 PM	Meeting Room 608, Convention Center
Closing Plenary	12:15 PM – 1:30 PM	Four Seasons Ballroom, Convention Center
2018 Joint Annual Meeting Program Committee Meeting	2:30 PM – 4:30 PM	Meeting Room 608, Convention Center
SysEB Final Business Meeting	2:30 PM – 3:30 PM	Meeting Room 703, Convention Center

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Presentations: Oral and Poster Displays

Sunday, November 5, 2017 • MORNING

Sunrise Session: Achieving Success as a Mentor Through Implementation of Effective Mentoring Strategies

Meeting Room 705/707 (Convention Center)

Moderators and Organizers: Cindy Simpson[1], Donna Dean[1], Ana Vélez[2], Lina Bernaola[3], and Katelyn Kesheimer[4], [1]Association for Women in Science, Washington, DC, [2]Univ. of Nebraska, Lincoln, NE, [3]Louisiana State Univ., Baton Rouge, LA, [4]Texas A&M Univ., Lubbock, TX

6:30 **Introductions**

6:30 **Group discussion and sharing: What aspects of mentoring are important?**

6:40 **Understanding the differences between mentoring, coaching, and sponsoring**

6:50 **Group discussion and sharing: How does your knowledge and experience influence mentoring?**

7:00 **Identifying the do's and don'ts involved in being a good mentor**

7:10 **Group discussion and sharing: What mentoring successes and/or challenges have you encountered?**

7:20 **Review of mentoring strategies and key issues impacting the mentoring relationship**

7:30 **Group discussion and sharing: What mentoring approaches have you found successful?**

7:40 **Questions & answers/Wrap-up**

Sunrise Session: "Bugs on Bugs": An Inquiry-Based, Collaborative Activity to Illustrate the Diversity of Arthropods and their Symbionts

Meeting Room 704/706 (Convention Center)

Moderators and Organizers: Evan Lampert[1], Jeanelle M. Morgan[2] and Swapna Bhat[1], [1]Univ. of North Georgia, Oakwood, GA, [2]Gainesville State College, Oakwood, GA

6:30 **Welcoming Remarks**

6:50 **Hands-on activity: Sampling "Bugs on Bugs"**

7:10 **Results of past Bugs on Bugs experiences**

7:20 **Breakout session: Entomology collaborations**

7:35 **Q&A: Surveys**

Member Symposium: Symposium in Honor of the Acarologist Carlos H. W. Flechtmann: Mite Odyssey

Meeting Room 711 (Convention Center)

Moderators and Organizers: Jose Carlos Rodrigues[1], Gilberto de Moraes[2] and Daniel Carrillo[3], [1]Univ. of Puerto Rico, San Juan, PR, [2]Univ. de São Paulo, Piracicaba, Brazil, [3]Univ. of Florida, Homestead, FL

8:00 **Introductory Remarks**

8:05 **0001** Of mites and women. **Carlos Flechtmann** (chwflech@usp.br), Univ. de São Paulo, Piracicaba, Brazil

8:35 **0002** Ecological advantage of being small: Capability to break in prey refuge. **Fernando da Silva** (silvafr@yahoo.com.br)[1,2], Yukie Sato[3], Izabela Lesna[4], Arne Janssen[4], Gilberto de Moraes[5] and Maurice W. Sabelis[4], [1]Univ. of Puerto Rico, San Juan, PR, [2]Univ. of Florida, Gainesville, FL, [3]National Agricultural Research Center, Tsukuba, Japan, [4]Univ. of Amsterdam, Amsterdam, Netherlands, [5]Univ. de São Paulo, Piracicaba, Brazil

8:50 **0003** Acarine plant-feeders and their predators: How diverse in Canada? **Fred Beaulieu** (frederic.beaulieu@agr.gc.ca) and Wayne Knee, Agriculture and Agri-Food Canada, Ottawa, ON, Canada

9:05 **0004** Understanding *Brevipalpus* mites and their relationships with the viruses they transmit. **Elliot Kitajima** (ewkitaji@usp.br)[1], Gerd Alberti[2] and J. Freitas-Astua[3], [1]Univ. de São Paulo, Piracicaba, Brazil, [2]Univ. Greifswald, Greifswald, Germany, [3]Embrapa Mandioca e Fruticultura, Cruz das Almas, Brazil

9:20 **0005** Cassava green mite biological control: Where do we go from here? **John Stephen Yaninek** (yaninek@purdue.edu), Purdue Univ., West Lafayette, IN

9:35 **0006** Pest exclusion strategies and phytosanitary irradiation treatment for *Brevipalpus*. **Andrea Beam** (andrea.l.beam@aphis.usda.gov)[1], Amy L. Roda[1], Scott W. Weihman[1] and Jessica Lindenmayer[2], [1]USDA - APHIS, Miami, FL, [2]Oklahoma State Univ., Perkins, OK

9:50 **Break**

10:05 **0007** In preparation for the potential incursion and spread of citrus leprosis in Florida. **Daniel Carrillo** (dancar@ufl.edu)[1], Marielle Berto[1], Clemete Garcia[2], Guillermo Leon[3], Ronald Ochoa[4], Luisa Cruz[1], W. Braswell[5], Roxanne Farris[6] and Amy L. Roda[7], [1]Univ. of Florida, Homestead, FL, [2]Centro Nacional de Sanidad e Inocuidad Agroalimentaria, Coyoacán, Mexico, [3]Colombian Corporation for Agricultural Research, Bogota, Colombia, [4]USDA - ARS, Beltsville, MD, [5]USDA - ARS, Edinburg, TX, [6]USDA - APHIS, Edinburg, TX, [7]USDA - APHIS, Miami, FL

10:20 **0008** Mites associated with the red poultry mite and their impact potential on biocontrol. **Eric Palevsky** (palevsky@volcani.agri.gov.il)[1], Shira Gal[1], Eitan Recht[2], Yuval Gotlieb[3], Efrat Gavish-Regev[4], Lise Roy[5], María Moraza[6], Eddie Ueckermann[7] and Monica Young[8], [1]Agricultural Research Organization, Ramat Yishay, Israel, [2]Plant Protection & Inspection Services, Bet Dagan, Israel, [3]The Hebrew Univ., Rehovot, Israel, [4]The Hebrew Univ., Jerusalem, Israel, [5]Univ. Paul Valéry, Montpellier, France, [6]Univ. de Navarra, Pamplona, Spain, [7]North West Univ., Potchefstroom, South Africa, [8]Univ. of Guelph, Guelph, ON, Canada

10:35 **0009** Transmission of citrus leprosis, cytoplasmic and nuclear types, by *Brevipalpus yothersi* and *B. californicus*. **Gabriel Otero-Colina** (gotero@colpos.mx)[1], Ronald Ochoa[2] and Gary R. Bauchan[2], [1]Colegio de Postgraduados, Montecillo, Mexico, [2]USDA - ARS, Beltsville, MD

10:50 **0010** Eriophyoidea are probably plant-feeding nematalycids. **Samuel Bolton** (samuel.bolton77@googlemail.com)[1], Philipp Chetverikov[2], Ronald Ochoa[3], Gary R. Bauchan[3], Pavel B. Klimov[4] and Hans Klompen[1], [1]The Ohio State Univ., Columbus, OH, [2]Saint-Petersburg State Univ., St. Petersburg, Russia, [3]USDA - ARS, Beltsville, MD, [4]Univ. of Michigan, Ann Arbor, MI

11:05 **SP0011** A new record and a new synonym of *Callyntrotus schlechtendali* Nalepa for the state of Maryland (Acari: Eriophyoidea). **Jenny Bo** (hjennybo@gmail.com), Andrew Ulsamer, Gary R. Bauchan and Ronald Ochoa, USDA - ARS, Beltsville, MD

11:15 **SP0012** Modifications of the pedipalp segment in Eriophyoidea. **James Amrine** (jamrine@wvu.edu), West Virginia Univ., Morgantown, WV

11:25 **SP0013** Three new families of beetle-associated astigmatid mites. **Barry O'Connor** (bmoc@umich.edu), Univ. of Michigan, Ann Arbor, MI

11:35 **0014** Accomplishments of Carlos Flechtmann and influence in Latin America of a life´s work. **Gilberto de Moraes** (moraesg@usp.br) and Diana Rueda-Ramírez, Univ. de São Paulo, Piracicaba, Brazil

11:50 **Concluding Remarks**

Grad 10-min: MUVE, Diptera, Mosquitoes 1

Meeting Room 302 (Convention Center)

Moderator: Sonya Schleich, U.S. Army Medical Command, Fort Sam Houston, TX

8:00 **0015** The distribution of container breeding mosquito species in urban areas of southern Oklahoma. **Jordan Sanders** (sdane@okstate.edu)[1], Kristy Bradley[2] and Bruce Noden[1], [1]Oklahoma State Univ., Stillwater, OK, [2]Oklahoma Dept. of Health, Oklahoma City, OK

8:10 **0016** Influence of fluctuating temperatures and nutrition on *Anopheles stephensi* reproductive success can reshape malaria transmission predictions in a warming world. **Shelley Whitehead** (saw359@psu.edu) and Matthew Thomas, Pennsylvania State Univ., University Park, PA

8:20 **0017** SkitoSnack: An artificial blood meal for mosquito control. **Kristina Gonzales** (gonza720@nmsu.edu), Stacy D. Rodriguez, Hae-Na Chung, Alora Garibay, Julia Vulcan, Margaret Kowalski, Emily Moore and Immo Hansen, New Mexico State Univ., Las Cruces, NM

8:30 **0018** Understanding *Aedes japonicus japonicus* distribution in container habitats. **Katherine Demeuse** (demeusek@msu.edu) and Michael Kaufman, Michigan State Univ., East Lansing, MI

8:40 **0019** Distribution and insecticide susceptibility status of Florida *Aedes aegypti* and *Aedes albopictus* populations. **Casey Parker** (caseyparker@ufl.edu) and C. Roxanne Connelly, Univ. of Florida, Vero Beach, FL

8:50 **0020** Presentation withdrawn

9:00 **0021** Midgut microbiomes in mosquitoes of south Texas: A comparison of field and laboratory populations. **Flor Martinez** (flor.a.martinez01@utrgv.edu), Kristine Lowe and Christopher Vitek, Univ. of Texas, Edinburg, TX

9:10 **0022** *Mycobacterium ulcerans* toxin regulates survivorship, development and resulting oviposition preference of *Aedes aegypti* (L.) (Diptera: Culicidae). **Abadi Mashlawi** (amashlawi@tamu.edu)[1], Heather Jordan[2], Tawni Crippen[3] and Jeffery Tomberlin[1], [1]Texas A&M Univ., College Station, TX, [2]Mississippi State Univ., Mississippi State, MS, [3]USDA - ARS, College Station, TX

9:20 **0023** Extrinsic incubation period of Zika virus in Florida *Aedes aegypti* and *Ae. albopictus*. **Rebecca Zimler** (razimler@ufl.edu) and Barry W. Alto, Univ. of Florida, Vero Beach, FL

9:30 **0024** The hierarchy of close range host cues used by female *Aedes aegypti* mosquitoes. **Benjamin DeMasi-Sumner** (bdema001@ucr.edu), Univ. of California, Riverside, CA

Grad 10-min: PBT, General Physiology 1

Meeting Room 301 (Convention Center)

Moderators: Ana Vélez[1] and John Ruberson[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Kansas State Univ., Manhattan, KS

8:00 **0025** Ultrastructural details of a strepsipteran eye – Everything you've wanted to know but were afraid to ask. **Marisano James** (mjajames@ucdavis.edu), Univ. of California, Davis, CA

8:10 **0026** Unraveling the development, genetics and evolution of wing transparency in Lepidoptera. **Aaron Pomerantz** (pomerantz_aaron@berkeley.edu) and Nipam Patel, Univ. of California, Berkeley, CA

8:20 **0027** Presentation withdrawn

8:30 **0028** Blood [K^+] recovery but not ATP maintenance predicts anoxia tolerance across life stages in *Drosophila*. **Jacob Campbell** (jacob.campbell.1@asu.edu) and Jon Harrison, Arizona State Univ., Tempe, AZ

8:40 **0029** Asian longhorned beetle (*Anoplophora glabripennis*) palp electrophysiology indicates well-developed sensitivity to humidity, along with certain volatile chemicals. **Loyal Hall** (lph1@psu.edu), Thomas C. Baker, Kelli Hoover and Fern Graves, Pennsylvania State Univ., University Park, PA

8:50 **0030** CO_2 receptor genes as potential targets for *Diabrotica virgifera virgifera* control. **Mariana Sanchez** (mariana.sanchez@huskers.unl.edu)[1], Arnubio Valencia[2], Joe Louis[1], Blair Siegfried[1] and Ana Vélez[1], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. de Caldas, Manizales, Colombia

9:00 **0031** The first identification of sex pheromones and sex attractants for North American click beetle species (Coleoptera: Elateridae) in the genus *Cardiophorus*. **Jacqueline Serrano** (jserr005@ucr.edu)[1], R. Maxwell Collignon[2], Yunfan Zou[1] and Jocelyn G. Millar[1], [1]Univ. of California, Riverside, CA, [2]USDA - ARS, Hilo, HI

9:10 **0032** Comparative morphology of sensilla on antenna, maxillary palp and labial palp of larvae of *Eucryptorrhynchus scrobiculatus* (Olivier) and *E. brandti* (Harold) (Coleoptera: Curculionidae). **Yuchao Yang** (yangyc68@126.com), Beijing Forestry Univ., Beijing, China

Grad 10-min: PBT, Pests and Resistance

Meeting Room 304 (Convention Center)

Moderators: Bryan French[1] and Matheus Ribeiro[2], [1]USDA - ARS, Brookings, SD, [2]Univ. of Nebraska, Lincoln, NE

8:00 **0033** Diet development for western corn rootworm and northern corn rootworm bioassays. **Man Huynh** (mphd32@mail.missouri.edu)[1,2], Lisa Meihls[3], Dalton Ludwick[2], Adriano Pereira[2], Stephen L. Lapointe[4], Randall P. Niedz[4], Bryan French[5], Bruce Hibbard[6] and Thomas Coudron[6], [1]Can Tho Univ., Can Tho, Vietnam, [2]Univ. of Missouri, Columbia, MO, [3]Evogene Inc, St. Louis, MO, [4]USDA - ARS, Fort Pierce, FL, [5]USDA - ARS, Brookings, SD, [6]USDA - ARS, Columbia, MO

8:10 **0034** Transcriptome response of western corn rootworm (*Diabrotica virgifera virgifera*) to Bt transgenic maize. **Zixiao Zhao** (zxzhao5@gmail.com)[1], Kent S. Shelby[2], Bruce Hibbard[2], Lisa Meihls[3], Thomas A. Courdon[2] and Christine Elsik[1], [1]Univ. of Missouri, Columbia, MO, [2]USDA - ARS, Columbia, MO, [3]Evogene Inc, St. Louis, MO

8:20 **0035** Effect of adult western corn rootworm pyrethroid resistance on performance of soil insecticides. **Dariane Souza** (dariane_lyra@hotmail.com)[1], Julie Peterson[2], Robert Wright[1] and Lance J. Meinke[1], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, North Platte, NE

8:30 **0036** Presentation withdrawn

8:40 **0037** Comparative assessment of the fumigant action of volatile oils from three garlic cultivars on cowpea beetle *Callosobruchus maculatus* (Fabricius) and faba bean beetle *Bruchidius incarnatus* (Boh.). Azhari Abdelbagi, Mubarak El-sonoussy, Hayat Hamid, **Abd Elaziz Ishag** (a.aziz30@gmail.com) and Ahmed Hammad, Univ. of Khartoum, Khartoum, Sudan

8:50 **0038** Life stage specific expression and regulatory function of conserved small RNAs in *Buchnera*, an obligate symbiont of aphids. **Margaret W. Thairu** (thairu2@illinois.edu), Siyuan Cheng and Allison Hansen, Univ. of Illinois, Champaign, IL

9:00 **0039** Diversity and function of a phage-infected bacterial symbiont, *Hamiltonella defensa,* from pea aphids. **Jayce W. Brandt** (jayce@uga.edu), Germain Chevignon, Kerry M. Oliver and Michael Strand, Univ. of Georgia, Athens, GA

9:10 **0040** Identifying mechanisms of host plant specialization in *Aphis craccivora* and its bacterial symbionts. **Thorsten Hansen** (teha237@g.uky.edu) and Jennifer A. White, Univ. of Kentucky, Lexington, KY

9:20 **0041** Investigating the role of host plant diet on DNA methylation and gene expression in the pea aphid-*Buchnera* symbiosis. **Dohyup Kim** (dkim291@illinois.edu) and Allison Hansen, Univ. of Illinois, Champaign, IL

Grad 10-min: P-IE, Biological Control

Meeting Room 404 (Convention Center)

Moderator: Eric Rebek, Oklahoma State Univ., Stillwater, OK

8:00 **0042** Impact of local insect herbivores on Brazilian peppertree prior to deployment of biological control agents in Florida. **Patricia Prade** (prade@ufl.edu)[1], Carey Minteer[1], James Cuda[2] and William A. Overholt[1], [1]Univ. of Florida, Fort Pierce, FL, [2]Univ. of Florida, Gainesville, FL

8:10 **0043** Natural enemies in blueberry agroecosystems: Implications of management practice and non-crop habitat. **Seth Whitehouse** (seth.whitehouse@uga.edu)[1], Jason Schmidt[1] and Ashfaq Sial[2], [1]Univ. of Georgia, Tifton, GA, [2]Univ. of Georgia, Athens, GA

8:20 **0044** Predicting impacts of insecticides on natural enemies of selected armored and soft scales. **Carlos Quesada** (cquesand@purdue.edu) and Clifford Sadof, Purdue Univ., West Lafayette, IN

8:30 **0045** Natural enemy responses to sugarcane aphid, *Melanaphis sacchari* (Zehntner) (Hemiptera: Aphididae), populations. **Anne Miskelley** (admiskel@email.uark.edu)[1], Nick Seiter[2], Gus Lorenz[3], Neelendra Joshi[1] and Glenn Studebaker[4], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Arkansas, Monticello, AR, [3]Univ. of Arkansas, Lonoke, AR, [4]Univ. of Arkansas, Keiser, AR

8:40 **0046** Assessing the impact of Argentine ant management on biological control of ant-tended hemipteran pests in citrus. **Kelsey Schall** (kscha008@ucr.edu) and Mark S. Hoddle, Univ. of California, Riverside, CA

8:50 **0047** A novel method of quantifying *Rhinoncomimus latipes* (Coleoptera: Curculionidae) feeding upon *Persicaria perfoliata* (Caryophyllales: Polygonaceae). **John Moredock** (jtmoredock@mix.wvu.edu) and Yong-Lak Park, West Virginia Univ., Morgantown, WV

9:00 **0048** Presentation withdrawn

9:10 **0049** Measuring tri-trophic impacts of neonicotinoids through soybean aphid and green peach aphid. **Carlos Esquivel** (esquivelpalma.1@buckeyemail.osu.edu), Luis A. Cañas and Andrew Michel, The Ohio State Univ., Wooster, OH

9:20 **0050** Spatial modeling improves prediction for bio-control impact on an invasive riparian tree. **Annie Henry** (annielh108@gmail.com)[1], Eduardo González[1], Wright Robinson[2], Bérenger Bourgeois[3] and Anna Sher[1], [1]Univ. of Denver, Denver, CO, [2]Grand County Utah, Moab, UT, [3]Univ. Laval, Québec City, QC, Canada

Grad 10-min: P-IE, General Ecology 1

Meeting Room 502 (Convention Center)

Moderator: Hannah J. Penn, Miami Univ., Oxford, OH

8:00 **0051** Plant response to a solitary versus gregarious parasitoid of the imported cabbagewom. **Ryan Paul** (rlpaul@rams.colostate.edu) and Paul Ode, Colorado State Univ., Fort Collins, CO

8:10 **0052** Quantifying the effect of pupal mass on flight potential and fecundity of gypsy moth (Lepidoptera: Erebidae). **Chelsea Jahant-Miller** (cjjahant@syr.edu) and Dylan Parry, State Univ. of New York, Syracuse, NY

8:20 **0053** Quantitative measure of tri-trophic fitness and its influence on diet breadth of insect herbivores. **Mayra Vidal** (mayracvidal@gmail.com) and Shannon Murphy, Univ. of Denver, Denver, CO

8:30 **0054** The potential of northern hardwood forests as a refuge for giant silk moths threatened by a non-target biological control agent. **Rea Manderino** (rmanderi@syr.edu)[1], Patrick Tobin[2] and Dylan Parry[1], [1]State Univ. of New York, Syracuse, NY, [2]Univ. of Washington, Seattle, WA

8:40 **0055** Insect community response to reclaimed well pads in a semi-arid natural gas field. **Michael Curran** (mcurran2@uwyo.edu) and Douglas Smith, Univ. of Wyoming, Laramie, WY

8:50 **0056** Grassland butterfly diet breadth and landscape use determines impacts of invasive plants and landscape configuration. **Katherine Kral** (katherine.kral@ndsu.edu), Torre Hovick, Ryan Limb and Jason Harmon, North Dakota State Univ., Fargo, ND

9:00 **0057** Novel host plant use in *Euphydryas phaeton*: Influences on caterpillar immunity, chemical defense, and interactions with natural enemies. **Nadya Muchoney** (nmuchoney@nevada.unr.edu)[1], M. Deane Bowers[2], Peri Mason[2], Mike Teglas[1] and Angela Smilanich[1], [1]Univ. of Nevada, Reno, NV, [2]Univ. of Colorado, Boulder, CO

9:10 **0058** Genetic variation in aspen (*Populus tremuloides* Michx.) phytochemical patterns structure windows of opportunity for gypsy moth (*Lymantria dispar* L.) larvae. **Michael Falk** (mfalk4@wisc.edu), Richard L. Lindroth and Kenneth Raffa, Univ. of Wisconsin, Madison, WI

9:20 **0059** Impacts of trichome consumption on offspring of tobacco hornworms (*Manduca sexta*). **Alexandra Serpi** (alex.serpi@psu.edu), Pennsylvania State Univ., University Park, PA

9:30 **0060** Quantifying carotenoid levels across insect groups to improve understanding of bird-insect food webs. **Ashley Kennedy** (kennedya@udel.edu) and Douglas W. Tallamy, Univ. of Delaware, Newark, DE

Grad 10-min: P-IE, IPM, Field Crops 1

Meeting Room 403 (Convention Center)

Moderator: Lily Calderwood, Cornell Univ., Ithaca, NY

8:00 **0061** Influence of cover crops and early season control strategies on insect pests in Mississippi soybean. **Adam Whalen** (daw153@msstate.edu)[1], Angus Catchot[1], Jeff Gore[2], Don Cook[2] and Trent Irby[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

8:10 **0062** Understanding dispersal by *Diabrotica virgifera virgifera*: Effects of larval density on flight and effect of flight on female reproduction. **Eric Yu** (eyuyu@iastate.edu)[1], Aaron J. Gassmann[1] and Thomas Sappington[2], [1]Iowa State Univ., Ames, IA, [2]USDA - ARS, Ames, IA

8:20 **0063** Effects of stink bug damage on early season corn development and yield. **Mason Ross** (mmr251@msstate.edu)[1], Angus Catchot[1], Don Cook[2], Jeff Gore[2], Whitney Crow[1] and Dung Bao[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

8:30 **0064** Influence of field and landscape factors on stink bug (Hemiptera: Pentatomidae) community in North Central soybean. **Daniela Pezzini** (pezzi004@umn.edu)[1], Debbie Finke[2], Thomas Hunt[3], Janet Knodel[4], Christian Krupke[5], Brian McCornack[6], Andrew Michel[7], Christopher R. Philips[1], Adam Varenhorst[8], Robert Wright[9] and Robert Koch[1], [1]Univ. of Minnesota, St. Paul, MN, [2]Univ. of Missouri, Columbia, MO, [3]Univ. of Nebraska, Concord, NE, [4]North Dakota State Univ., Fargo, ND, [5]Purdue Univ., West Lafayette, IN, [6]Kansas State Univ., Manhattan, KS, [7]The Ohio State Univ., Wooster, OH, [8]South Dakota State Univ., Brookings, SD, [9]Univ. of Nebraska, Lincoln, NE

8:40 **0065** Spatial distribution of Hessian fly, *Mayetiola destructor* (Diptera: Cecidomyiidae), within commercial wheat fields. **Ryan Schmid** (rbschmid@ksu.edu)[1,2] and Brian McCornack[1,2], [1]Kansas State Univ., Manhattan, KS, [2]Plant Biosecurity Cooperative Research Centre, Bruce, Australia

8:50 **0066** Survey of the western corn rootworm (*Diabrotica virgifera virgifera* LeConte) microbiome across all life stages. **Dalton Ludwick** (dclmrd@mail.missouri.edu)[1], Aaron Ericsson[1], Michelle Gregory[2], Lisa Meihls[3], Bruce Hibbard[2], Thomas Coudron[2] and Kent S. Shelby[2], [1]Univ. of Missouri, Columbia, MO, [2]USDA - ARS, Columbia, MO, [3]Evogene Inc, St. Louis, MO

9:00 **0067** Evaluation of seed and in-furrow treatments for sunflower in South Dakota. **Brady Hauswedell** (brady.hauswedell@sdstate.edu)[1], Philip Rozeboom[1], J. P. Michaud[2], Janet Knodel[3] and Adam Varenhorst[1], [1]South Dakota State Univ., Brookings, SD, [2]Kansas State Univ., Hays, KS, [3]North Dakota State Univ., Fargo, ND

9:10 **0068** Detecting corn rootworm (*Diabrotica* spp.) resistance development to Bt-RW traits: Root injury vs. lodging and yield. **Edwin Benkert, III** (benke017@umn.edu) and Ken Ostlie, Univ. of Minnesota, St. Paul, MN

9:20 **0069** The spatial distribution of rice water weevil, *Lissorhoptrus oryzophilus* Kuschel, populations in untreated rice fields in Louisiana. **Megan Mulcahy** (mmulca2@lsu.edu)[1], Blake Wilson[2] and Thomas Reagan[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Louisiana State Univ., St. Gabriel, LA

9:30 **0070** Management of rice water weevil in water conservation rice production systems. **Read Kelly** (frk12@msstate.edu)[1], Jeff Gore[2], Angus Catchot[3], Don Cook[2], Jason Krutz[2] and Bobby Golden[2], [1]Mississippi State Univ., Leland, MS, [2]Mississippi State Univ., Stoneville, MS, [3]Mississippi State Univ., Mississippi State, MS

9:40 **0071** Boll weevil (*Anthonomus grandis grandis* Boheman) population genomics as a tool for area-wide management. **Tyler Raszick** (tjraszick@gmail.com)[1], Charles Suh[2], Raul Ruiz-Arce[3] and Gregory Sword[1], [1]Texas A&M Univ., College Station, TX, [2]USDA - ARS, College Station, TX, [3]USDA - APHIS, Edinburg, TX

Grad 10-min: P-IE, IPM, Forests and General

Meeting Room 501 (Convention Center)

Moderator: Michael Brewer, Texas A&M Univ., Corpus Christi, TX

8:00 **0072** Improving crop pest management using qualitative data networks. **Nancy Bostick** (nbostick@uga.edu)[1], Jason Schmidt[1], C. T. Bargeron[1], Tim Brenneman[1], Albert K. Culbreath[1], G. David Buntin[2], Joseph LaForest[1] and Michael Toews[1], [1]Univ. of Georgia, Tifton, GA, [2]Univ. of Georgia, Griffin, GA

8:10 **0073** Influence of landscape complexity on the efficacy of sustainable agricultural practices in Kenya. **Tim Luttermoser** (tjl235@cornell.edu)[1], Charles Midega[2], Zeyaur Khan[2] and Katja Poveda[1], [1]Cornell Univ., Ithaca, NY, [2]International Centre of Insect Physiology and Ecology, Nairobi, Kenya

8:20 **0074** Developing a semiochemical repellent to protect walnuts from the invasive walnut twig beetle, *Pityophthorus juglandis*. **Jackson Audley** (jpaudley@ucdavis.edu)[1], Paul L. Dallara[1] and Steven Seybold[2], [1]Univ. of California, Davis, CA, [2]USDA - Forest Service, Davis, CA

8:30 **0075** Distribution pattern of thrips and tomato chlorotic spot virus (TCSV) in tomatoes in south Florida. **Rafia Khan** (rkhan@ufl.edu)[1], Dakshina Seal[1], Shouan Zhang[1], Oscar Liburd[2], Edward Evans[1] and Rajagopalbabu Srinivasan[3], [1]Univ. of Florida, Homestead, FL, [2]Univ. of Florida, Gainesville, FL, [3]Univ. of Georgia, Tifton, GA

8:40 **0076** Determining factors that affect host use by the invasive vinegar fly *Drosophila suzukii* (Diptera: Drosophilidae). **Katharine Swoboda Bhattarai** (kaswobod@ncsu.edu) and Hannah Burrack, North Carolina State Univ., Raleigh, NC

8:50 **0077** The development of thousand cankers disease (TCD) in the eastern United States. **Tyler Stewart** (stewar23@purdue.edu)[1], Margaret McDermott[2], Jennifer Juzwik[3] and Matthew Ginzel[1], [1]Purdue Univ., West Lafayette, IN, [2]Univ. of Minnesota, St. Paul, MN, [3]USDA - Forest Service, St. Paul, MN

9:00 **0078** Direct pest control through season long net enclosure of apple orchards. **Adrian Marshall** (atmarshall@wsu.edu) and Elizabeth H. Beers, Washington State Univ., Wenatchee, WA

9:10 **0079** Presentation withdrawn

9:20 **0080** Management of lawn caterpillar pests by manipulating turfgrass cultivar diversity. **Ethan Doherty** (edoherty13@ufl.edu), Univ. of Florida, Gainesville, FL

9:30 **0081** Survival of stored-product psocids (Psocoptera: Liposcelididae) at relative humidities of 43 and 50%. **Abena Ocran** (abena.ocran@okstate.edu), George Opit and Kandara Shakya, Oklahoma State Univ., Stillwater, OK

9:40 **0082** Forest fragments buffer tree stress and insect pests associated with urbanization. **Lawrence Long** (lclong2@ncsu.edu) and Steven Frank, North Carolina State Univ., Raleigh, NC

Grad 10-min: P-IE, Pollination 1

Meeting Room 405 (Convention Center)

Moderator: Theresa Pitts-Singer, USDA - ARS, Logan, UT

8:00 **0083** Effects of climate change on nectar microbes and pollinator preference. **Kaleigh Russell** (kruss002@ucr.edu) and Quinn McFrederick, Univ. of California, Riverside, CA

8:10 **0084** Pathogen dynamics in bee communities. **Briana Ezray** (bde125@psu.edu) and Heather M. Hines, Pennsylvania State Univ., University Park, PA

8:20 **0085** The effects of landscapes and farm practices on the performance of the common eastern bumble bee (*Bombus impatiens*). **Nelson Milano** (njm54@cornell.edu)[1], Scott McArt[1] and Brian A. Nault[2], [1]Cornell Univ., Ithaca, NY, [2]Cornell Univ., Geneva, NY

8:30 **0086** Comparing the foraging effort of honey bees and bumble bees through time and among sites in a shared landscape. **Danny Minahan** (dfminahan@wisc.edu)[1] and Johanne Brunet[2], [1]Univ. of Wisconsin, Madison, WI, [2]USDA - ARS, Madison, WI

8:40 **0087** Environmental stresses and their effect on pollen and nectar quality. **Rachel Olsson** (rachel.olsson@wsu.edu), David Crowder and Robert Schaeffer, Washington State Univ., Pullman, WA

8:50 **0088** Population trends and ecosystem services of the common eastern bumble bee (*Bombus impatiens*). **Carley M. McGrady** (rxm452@psu.edu)[1], James P. Strange[2], Hannah N. Balko[1] and Shelby J. Fleischer[1], [1]Pennsylvania State Univ., University Park, PA, [2]USDA - ARS, Logan, UT

9:00 **0089** Does on-farm diversity affect bee health and communities in highly cultivated landscapes? **Ashley St. Clair** (astclair@iastate.edu), Adam Dolezal, Ge Zhang, Edward Hsieh, Matthew O'Neal and Amy Toth, Iowa State Univ., Ames, IA

9:10 **0090** Insights into the overwintering strategies of North American hoverflies (Syrphidae: Syrphinae). **Carl Clem** (carlc2@illinois.edu) and Alexandra Harmon-Threatt, Univ. of Illinois, Champaign, IL

9:20 **0091** Life table analysis of the alfalfa leafcutting bee, *Megachile rotundata*. **Claire Donahoo** (claire.donahoo@montana.edu) and Robert K. D. Peterson, Montana State Univ., Bozeman, MT

9:30 **0092** Pathogen transmission among bees through shared floral resources: The role of flower species and pathogen placement. **Laura Figueroa** (llf44@cornell.edu)[1], Lynn S. Adler[2], Rebecca E. Irwin[3], Cali Grincavitch[2], Emilia Mann[2], Lucy Metz[2], Amy Zhao[2] and Scott McArt[1], [1]Cornell Univ., Ithaca, NY, [2]Univ. of Massachusetts, Amherst, MA, [3]North Carolina State Univ., Raleigh, NC

9:40 **0093** Does a semiochemical tool widely used for protecting trees from Douglas-fir beetle (*Dendroctonus pseudotsugae*) infestation affect the associated bee community? **Gabriel Foote** (gabriel.foote@oregonstate.edu)[1], Christopher J. Fettig[2], Darrell W. Ross[1], Justin Runyon[3], Tom W. Coleman[4], Monica Gaylord[5], Andrew Graves[4], Laura Lowrey[6], Joel D. McMillin[5], Steve Munson[7], Leif Mortenson[8] and Agenor Mafra-Neto[9], [1]Oregon State Univ., Corvallis, OR, [2]USDA - Forest Service, Davis, CA, [3]USDA - Forest Service, Bozeman, MT, [4]USDA - Forest Service, Albuquerque, NM, [5]USDA - Forest Service, Flagstaff, AZ, [6]USDA - Forest Service, Boise, ID, [7]USDA - Forest Service, Ogden, UT, [8]USDA - ARS, Albany, CA, [9]ISCA Technologies, Inc, Riverside, CA

Grad 10-min: PBT, General Physiology 2

Meeting Room 301 (Convention Center)

Moderators: Andrei Alyokhin[1] and Cameron Jack[2], [1]Univ. of Maine, Orono, ME, [2]Oregon State Univ., Corvallis, OR

10:00 **0094** The influence of brood on the transcriptional profiles in the brain of the worker red imported fire ants (*Solenopsis invicta*). **Chloë Hawkings** (chloe.hawks@tamu.edu) and Cecilia Tamborindeguy, Texas A&M Univ., College Station, TX

10:10 **0095** Cloning, expression and functional characterization of a honey bee (*Apis mellifera*) digestive phospholipase A2. **Yiyun Xu** (yxtd8@mail.missouri.edu)[1,2], Joseph Ringbauer[1], Cynthia Goodman[1], Tamra Reall[1], David Stanley[1] and Qisheng Song[2], [1]USDA - ARS, Columbia, MO, [2]Univ. of Missouri, Columbia, MO

10:20 **0096** Development of black soldier fly *Hermetia illucens* (Diptera: Stratiomyidae) on marine waste. **Joshua Villazana** (joshua.villazana@maine.edu), Dylan Cunningham and Andrei Alyokhin, Univ. of Maine, Orono, ME

10:30 **0097** Effects of diet and humidity on *Drosophila suzukii* flight parameters. **Jessica Wong** (jessicawong2420@gmail.com)[1,2] and Jana Lee[2], [1]Oregon State Univ., Corvallis, OR, [2]USDA - ARS, Corvallis, OR

10:40 **0098** The potential role of hexamerins in coordinating nutrition and calling behavior in the Caribbean fruit fly, *Anastrepha suspensa*. **Clancy Short** (cashort@ufl.edu) and Daniel Hahn, Univ. of Florida, Gainesville, FL

10:50 **0099** Presentation withdrawn

11:00 **0100** Greater than the sum of its parts? Dissection of *Drosophila* gut microbiome function. **John McMullen** (jgm263@cornell.edu) and Angela E. Douglas, Cornell Univ., Ithaca, NY

11:10 **0101** Impact of sucrose on black soldier fly longevity and eggs production. **Justine Richard-Giroux** (justine.richard-giroux.1@ulaval.ca)[1,2] and Aline Spindola[2], [1]Univ. Laval, Stoneham, QC, Canada, [2]Texas A&M Univ., College Station, TX

11:20 **0102** Immune gene expression varies across different mosquito tissues containing either circulating, sessile, or periostial hemocytes. **Leah T. Sigle** (leah.t.sigle@vanderbilt.edu), Tania Y. Estevez-Lao, David Rinker, John A. Capra and Julian F. Hillyer, Vanderbilt Univ., Nashville, TN

11:30 **0103** Males matter: How males affect female diapause phenotype in *Culex pipiens*. **Robin Bautista Jimenez** (bautista-jimenez.1@osu.edu) and Megan E. Meuti, The Ohio State Univ., Columbus, OH

11:40 **0104** Ecdysis triggering hormone, a multifunctional peptide regulating reproduction of *Aedes aegypti*. **Yike Ding** (yding005@ucr.edu), Univ. of California, Riverside, CA

Grad 10-min: P-IE, Biocontrol Parasitoids, Pathogens, and Predators

Meeting Room 404 (Convention Center)

Moderator: J. P. Michaud, Kansas State Univ., Hays, KS

10:00 **0105** Laboratory rearing and non-target testing of *Apanteles opuntiarum* for biological control of *Cactoblastis cactorum*. **Jessica Awad** (jessica.awad@freshfromflorida.com)[1], Amanda Hodges[2] and Eric Rohrig[1], [1]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL, [2]Univ. of Florida, Gainesville, FL

10:10 **0106** Spider communities within Nebraska agroecosystems: How do management practices and pesticide use impact spider diversity and abundance? **Samantha Daniel** (sdaniel403@gmail.com)[1], Robert Wright[1] and Julie Peterson[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, North Platte, NE

10:20 **0107** The ecology of fear: Understanding how the threat of predation impacts insect prey. **Sara Hermann** (slh@msu.edu) and Douglas A. Landis, Michigan State Univ., East Lansing, MI

10:30 **0108** Categorizing the host foraging preferences of potential biological control agent *Trissolcus japonicus* (Hymenoptera: Scelionidae) using different host species' kairomones. **Sean Boyle** (seanboyl@udel.edu)[1], Kim Hoelmer[2] and Judith A. Hough-Goldstein[1], [1]Univ. of Delaware, Newark, DE, [2]USDA - ARS, Newark, DE

10:40 **0109** Effects of sugar feeding on longevity, egg load and egg volume in two bivoltine braconid parasitoids that attack *Cephus cinctus* Norton. **Dayane A. Reis** (dayane.reis@msu.montana.edu), Megan L. Hofland, Robert K. D. Peterson, John M. Martin and David K. Weaver, Montana State Univ., Bozeman, MT

10:50 **0110** Barriers to biological control of aphids in winter canola by *Diaeretiella rapae*. **William Jessie** (w.jessie@okstate.edu)[1], Kris Giles[1], Tom Royer[1], Mark Payton[1], Norman Elliott[2] and J. P. Michaud[3], [1]Oklahoma State Univ., Stillwater, OK, [2]USDA - ARS, Stillwater, OK, [3]Kansas State Univ., Hays, KS

11:00 **0111** The benefits of crop diversity for populations of *Bracon cephi* Gahan *and B. lissogaster* Muesebeck, parasitoids of the wheat stem sawfly, *Cephus cinctus* Norton. **Benjamin Fischer** (benfischer9@gmail.com), Megan L. Hofland, Perry R. Miller and David Weaver, Montana State Univ., Bozeman, MT

11:10 **0112** Optimal age for rearing *Ooencyrtus* sp. nr. *telenomicida* (Hymenoptera: Encyrtidae) on *Bagrada hilaris* (Hemiptera: Pentatomidae) eggs. **Nancy Power** (npowe001@ucr.edu), Thomas Perring, Shayla Hampel and Fatemeh Ganjisaffar, Univ. of California, Riverside, CA

11:20 **0113** Age-stage, two-sex life table of *Amblyseius eharai* (Amitai et Swirski) (Acari: Phytoseiidae). **Young-gyun Park** (insect1141@snu.ac.kr), Sunghoon Baek and Joon-Ho Lee, Seoul National Univ., Seoul, South Korea

11:30 **0114** Twospotted spider mite on hops in the Midwest: Management by augmentative biological control. **Susan Ndiaye** (ndaiye.32@osu.edu), The Ohio State Univ., Columbus, OH

Grad 10-min: P-IE, Chemical Ecology

Meeting Room 304 (Convention Center)

Moderator: Gregory J. Wiggins, Univ. of Tennessee, Knoxville, TN

10:00 **0115** Fungal endophytes alter volatile emissions in cotton and deter sucking bugs. **Cody Gale** (ccg2809@gmail.com)[1], Jose Perez[2], Charles Suh[2] and Gregory Sword[1], [1]Texas A&M Univ., College Station, TX, [2]USDA - ARS, College Station, TX

10:10 **0116** Electrophysiological and behavioural responses of the variegated coffee bug, *Antestiopsis thunbergii* (Heteroptera: Pentatomidae) to green Arabica coffee berry odors. **Teresiah Njihia** (tnjihia@icipe.org)[1,2], Baldwyn Torto[1], Lucy Murungi[2], Janet Irungu[1], Dickson Mwenda[1] and Régis Babin[1], [1]International Centre of Insect Physiology and Ecology, Nairobi, Kenya, [2]Jomo Kenyatta Univ. of Agriculture and Technology, Nairobi, Kenya

10:20 **0117** The effectiveness and specificity of mixtures of leaf and fruit volatiles as trap baits for *Drosophila suzukii*. **Grant Bolton** (lgbcm4@mail.missouri.edu)[1], Bruce A. Barrett[1] and Jaime Pinero[2], [1]Univ. of Missouri, Columbia, MO, [2]Lincoln Univ., Jefferson City, MO

10:30 **0118** Potential metabolism of toxins by *Aspergillus flavus*, a facultative mutualist of the navel orangeworm (*Amyelois transitella*). **Daniel Bush** (dsbush2@illinois.edu)[1], Daniel Raudabaugh[1], Mark Demkovich[1], Joel Siegel[2] and May Berenbaum[1], [1]Univ. of Illinois, Champaign, IL, [2]USDA - ARS, Parlier, CA

10:40 **0119** Indirect manipulation of plant induced defenses by parasitoids of caterpillars. **Ching-Wen Tan** (czt5069@psu.edu), Michelle Peiffer and Gary Felton, Pennsylvania State Univ., University Park, PA

10:50 **0120** Olfactory-based host location in a specialist phytophagous insect: Odor object or habitat cue? **Michael Wolfin** (msw266@cornell.edu), Gregory Loeb and Charles E. Linn, Cornell Univ., Geneva, NY

11:00 **0121** Using cameras to quantify response by natural enemies to eggs and pheromones of cerambycid beetles in field bioassays. **Todd D. Johnson** (tdjohns2@illinois.edu), Brandon Rice and Lawrence M. Hanks, Univ. of Illinois, Champaign, IL

11:10 **0122** Cover crop species affect AMF-induced changes in maize resistance to fall armyworm (*Spodoptera frugiperda*). **Elizabeth Davidson-Lowe** (exd33@psu.edu) and Jared Ali, Pennsylvania State Univ., University Park, PA

11:20 **0123** Host colonization behavior of the peach bark beetle, *Phloeotribus liminaris* (Coleoptera: Scolytinae), is mediated by benzaldehyde. **Matthew W. Ethington** (methingt@purdue.edu) and Matthew Ginzel, Purdue Univ., West Lafayette, IN

11:30 **0124** Pine engravers carry bacterial communities whose members reduce concentrations of host monoterpenes with variable degrees of redundancy, specificity, and capability. **Michael Howe** (howe3@wisc.edu), Ken Keefover-Ring and Kenneth Raffa, Univ. of Wisconsin, Madison, WI

Grad 10-min: P-IE, General Ecology 2

Meeting Room 502 (Convention Center)

Moderator: Ernest Delfosse, Michigan State Univ., East Lansing, MI

10:00 **0125** Genetic diversity analysis of *Aphis gossypii* (Hemiptera: Aphididae) by using microsatellite markers. **Hwa Yeun Nam** (jessienam@snu.ac.kr), Yujeong Park and Joon-Ho Lee, Seoul National Univ., Seoul, South Korea

10:10 **0126** Mason bee construction: Patterns of soil composition across species, nest tubes, and partitions. **Mario Pinilla-Gallego** (simonpinilla@yahoo.com), James Crum and Rufus Isaacs, Michigan State Univ., East Lansing, MI

10:20 **0127** Aphid performance and susceptibility to natural enemies on a gradient of drought-stressed host plants. **Jessica Kansman** (jtkp8b@missouri.edu) and Debbie Finke, Univ. of Missouri, Columbia, MO

10:30 **0128** Effects of burn timing on native bee communities of Illinois. **Brenna Decker** (bldecke2@illinois.edu) and Alexandra Harmon-Threatt, Univ. of Illinois, Champaign, IL

10:40 **0129** Predators of the pine bark adelgid, *Pineus strobi* (Hemiptera: Adelgidae), a native insect in the forests of southwestern Virginia. **Holly Wantuch** (wholly3@vt.edu)[1], Scott Salom[1], Thomas Kuhar[1] and Nathan Havill[2], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]USDA - Forest Service, Hamden, CT

10:50 **0130** Following the frass finds subterranean termites affecting elemental concentrations in Ultisol soils. **Yi-an Chen** (nynaeve1@uga.edu) and Brian T. Forschler, Univ. of Georgia, Athens, GA

11:00 **0131** Acoustic monitoring of seasonal diversity trends in pollinator communities. **Elizabeth Hedrick** (elizabeth.hedrick001@my.lincolnu.edu) and David Heise, Lincoln Univ., Jefferson City, MO

11:10 **0132** Microbial communities in ground-nesting bee brood cells: Diverse, stable, and unique. **Kristen Brochu** (kb532@cornell.edu) and Bryan N. Danforth, Cornell Univ., Ithaca, NY

11:20 **0133** Susceptibility of diamondback moth eggs and neonates to rainfall on Chinese cabbage and common cabbage plant. **Md. Mahbubur Rahman** (md.rahman1@uq.net.au), Michael J. Furlong and Myron Zalucki, Univ. of Queensland, Brisbane, Australia

11:30 **0134** Can variation in seed removal patterns of neotropical pioneer tree species be explained by local ant community composition? **Selina Ruzi** (ruzi2@illinois.edu) and Andrew Suarez, Univ. of Illinois, Champaign, IL

Grad 10-min: P-IE, General Ecology 3

Meeting Room 503 (Convention Center)

Moderator: Laura Weiser Erlandson, Texas A&M Univ., Killeen, TX

10:00 **0135** Effects of insect herbivory on restored tallgrass plant communities. **Sarah Black** (sarah.black@siu.edu) and Sara Baer, Southern Illinois Univ., Carbondale, IL

10:10 **0136** Does plant community composition drive the frequency or type of plant problems in residential landscapes? **Christopher B. Riley** (riley.595@osu.edu)[1], Michael J. Raupp[2], Kelby L. Fite[3] and Mary Gardiner[1], [1]The Ohio State Univ., Columbus, OH, [2]Univ. of Maryland, College Park, MD, [3]Bartlett Tree Research Laboratories, Charlotte, NC

10:20 **0137** Assessing reclamation success using remote sensing techniques to analyze vegetation communites in conjunction with a chronosequence depicting invertebrate recolonization on oil and gas well pads in the Pinedale Anticline, Wyoming. **Megan Wilson** (mwilso39@uwyo.edu) and Timothy Collier, Univ. of Wyoming, Laramie, WY

10:30 **0138** The global value of ecosystem services on organic and conventional farms. **Elias Bloom** (elias.bloom@wsu.edu), David Crowder and John Reganold, Washington State Univ., Pullman, WA

10:40 **0139** Connecting land use, soil, vegetation, and locust abundance in a Senegalese subsistence farming village. **Mira Word** (mword@asu.edu)[1], Marion Le Gall[1], Balanding Manneh[1], Ruth Farington[1], Alioune Bèye[2] and Arianne Cease[1], [1]Arizona State Univ., Tempe, AZ, [2]Direction de la Protection des Végétaux, Dakar, Senegal

10:50 **0140** Does within-plant allocation of defense predictably adapt in response to enemy release? **Stacy Endriss** (stacy.endriss@gmail.com), Ruth A. Hufbauer and Andrew P. Norton, Colorado State Univ., Fort Collins, CO

11:00 **0141** Effects of pine straw removal on arthropods in longleaf pine communities. **Samuel Buzuleciu** (sabuzule@ncsu.edu) and Clyde E. Sorenson, North Carolina State Univ., Raleigh, NC

11:10 **0142** Ecological enrichment in agroecosystems: Utilizing wildflowers to promote beneficial arthropod communities. **Shereen Xavier** (shereen.xavier25@uga.edu)[1], Dawn Olson[2], Alisa Coffin[2] and Jason Schmidt[1], [1]Univ. of Georgia, Tifton, GA, [2]USDA - ARS, Tifton, GA

11:20 **0143** Endophytic fungi affect herbivorous pest resistance and tolerance in *Sorghum bicolor* and *Zea mays* via life-history and demography. **Leah Buchman** (lwb43@tamu.edu), Gregory Sword and Julio S. Bernal, Texas A&M Univ., College Station, TX

11:30 **0144** The effects of residential development soil mitigation strategies on invertebrate biodiversity and ecosystem services. **Matthew Borden** (m.borden@ufl.edu) and Adam Dale, Univ. of Florida, Gainesville, FL

Grad 10-min: P-IE, Invasive Species

Meeting Room 501 (Convention Center)

Moderator: Rob Morrison, USDA - ARS, Manhattan, KS

10:00 **0145** Development of *Metcalfa pruinosa* (Hemiptera: Flatidae) immigration model into Korea soybean field. **Min-Jung Kim** (2017-24294@snu.ac.kr), Sunghoon Baek and Joon-Ho Lee, Seoul National Univ., Seoul, South Korea

10:10 **0146** Induction phenology and response to semiochemicals of winter morph spotted wing *Drosophila*. **Heather Leach** (leachhea@msu.edu), Danielle Kirkpatrick, Jaclyn Stone, Peng Xu, Ke Dong, Larry Gut and Rufus Isaacs, Michigan State Univ., East Lansing, MI

10:20 **0147** Characterization of the sugarcane aphid microbiome in the continental U.S. **Jocelyn R. Holt** (holtjocelyn@tamu.edu)[1], Alex Styer[2], Josephine Antwi[3], J. Scott Armstrong[4], Jason Wulff[1], Jennifer A. White[2], Samuel Nibouche[5], Laurent Costet[5], Gary Peterson[6], Neal McLaren[7] and Raul Medina[1], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Kentucky, Lexington, KY, [3]Oregon State Univ., Hermiston, OR, [4]USDA - ARS, Stillwater, OK, [5]CIRAD - INRA, Saint-Pierre, France, [6]Texas A&M Univ., Lubbock, TX, [7]Univ. of the Free State, Bloemfontein, South Africa

10:30 **0148** Evaluating tactile repellents for brown marmorated stink bug, *Halyomorpha halys* (Stål). **Hayley Bush** (hgbush93@vt.edu)[1], Thomas P. Kuhar[1], Robert Bedoukian[2], Karen McKenzie[2] and Marie Maher[2], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Bedoukian Research, Inc, Danbury, CT

10:40 **0149** Farm-scape factors influencing the abundance and distribution of brown marmorated stink bug among Mid-Atlantic apple orchards. **Whitney Hadden** (wthadden@vt.edu)[1], Christopher Bergh[2] and Tracy C. Leskey[3], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Virginia Polytechnic Institute and State Univ., Winchester, VA, [3]USDA - ARS, Kearneysville, WV

10:50 **0150** Spotted lanternfly, *Lycorma delicatula* (White): Potential impact and chemical control in vineyards. **Erica Smyers** (ecs5026@psu.edu), Michael Saunders, Ken Kim and Julie Urban, Pennsylvania State Univ., University Park, PA

11:00 **0151** Guardians of the kudzu: The impact of natural enemies and drought on kudzu bug populations. **Amy Michael** (amicha12@vols.utk.edu)[1], Kadie Byrd[2], Scott Stewart[3], Gregory J. Wiggins[1], Bonnie Ownley[1] and Jerome F. Grant[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [3]Univ. of Tennessee, Jackson, TN

11:10 **0152** Function of beta-glucosidases in chemical communication of the Asian longhorned beetle, *Anoplophora glabripennis* (Coleoptera: Cerambycidae). **Scott Gula** (sgula@purdue.edu)[1], Leslie Kuhn[2], Ann M. Ray[3] and Matthew Ginzel[1], [1]Purdue Univ., West Lafayette, IN, [2]Michigan State Univ., East Lansing, MI, [3]Xavier Univ., Cincinnati, OH

11:20 **0153** Entomopathogenic fungi control and overwintering of *Drosophila suzukii*. **Rosalee Knipp** (rknipp@uark.edu)[1], Donald C. Steinkraus[1] and Donn Johnson[2], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Arkansas, Lonoke, AR

11:30 **0154** Emerald ash borer host expansion: Implications for biological control. **David Olson** (olsondgm@gmail.com) and Lynne Rieske-Kinney, Univ. of Kentucky, Lexington, KY

11:40 **0155** Protecting trees against emerald ash borer: What does it take to be a good neighbour? **Dora Mwangola** (mkabilidora@gmail.com) and Brian Aukema, Univ. of Minnesota, St. Paul, MN

Grad 10-min: P-IE, IPM, Field Crops 2

Meeting Room 403 (Convention Center)

Moderators: Josephine Antwi[1] and Jawwad Qureshi[2], [1]Oregon State Univ., Hermiston, OR, [2]Univ. of Florida, Fort Pierce, FL

10:00 **0156** Effects of landscape structure on the biodiversity of pest and beneficial insects in the south Texas cotton agro-ecosystem. **Isaac Esquivel** (iesqu002@tamu.edu)[1], Michael Brewer[2] and Robert Coulson[1], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., Corpus Christi, TX

10:10 **0157** Presentation withdrawn

10:20 **0158** Effect of crop rotation on soybean aphid. **Erika Rodbell** (erodbell@iastate.edu), Erin Hodgson, Matthew Liebman and Matthew O'Neal, Iowa State Univ., Ames, IA

10:30 **0159** Management of sugarcane aphid in grain sorghum using planting date, insecticides, and plant resistance. Phillip Haar[1], **G. David Buntin** (gbuntin@uga.edu)[2], Jason Schmidt[3] and Michael Toews[3], [1]Univ. of Georgia, Athens, GA, [2]Univ. of Georgia, Griffin, GA, [3]Univ. of Georgia, Tifton, GA

10:40 **0160** Influence of nitrogen and silicon nutrition on development and reproduction of *Melanaphis sacchari* (Zehntner) (Hemiptera: Aphididae) in sorghum. **Luna Lama** (llama1@lsu.edu)[1], Blake Wilson[2], Jeffrey Davis[1] and Thomas Reagan[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Louisiana State Univ., St. Gabriel, LA

10:50 **0161** Settlement and departure preferences of *Bactericera cockerelli* (Hemiptera: Triozidae). **Abigail Cohen** (abigail.cohen@wsu.edu) and David Crowder, Washington State Univ., Pullman, WA

11:00 **0162** Evaluating insecticide efficacy and residual activity for control of the sugarcane aphid *Melanaphis sacchari* (Zehntner). **John David Gonzales** (johndavid.gonzales@ag.tamu.edu)[1], David Kerns[2] and Greg Wilson[3], [1]Texas A&M Univ., Muleshoe, TX, [2]Texas A&M Univ., College Station, TX, [3]Texas A&M Univ., Bryan, TX

11:10 **0163** Within-plant distribution of brown stink bug, *Euschistus servus* (Say) (Heteroptera: Pentatomidae) in corn and its implications on stink bug management in corn. **Arun Babu** (ababu2@ncsu.edu)[1], Wesley Everman[1], Ronnie Heiniger[2], James F. Walgenbach[3] and Dominic Reisig[2], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Plymouth, NC, [3]North Carolina State Univ., Mills River, NC

11:20 **0164** Biology, distribution, and management of peanut burrower bug, *Pangaeus bilineatus*, in south Georgia peanut systems. **Benjamin Aigner** (ben.aigner@uga.edu) and Mark R. Abney, Univ. of Georgia, Tifton, GA

11:30 **0165** Evaluation of rice stink bug, *Oebalus pugnax*, damage to maturing rice kernels as a function of infestation level. **Aaron Cato** (ajcato@email.uark.edu)[1], Jarrod T. Hardke[2] and Gus Lorenz[3], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Arkansas, Stuttgart, AR, [3]Univ. of Arkansas, Lonoke, AR

11:40 **0166** Optimization of spectral bandwidths and wavelengths for detection of *Aphis glycines* in soybean. **Tavvs M. Alves** (alves011@umn.edu)[1], Roger Moon[1], Ian MacRae[2] and Robert Koch[1], [1]Univ. of Minnesota, St. Paul, MN, [2]Univ. of Minnesota, Crookston, MN

Grad 10-min: P-IE, Pollination 2

Meeting Room 405 (Convention Center)

Moderators: Tahir Rashid[1] and Charles Allen[2], [1]Alcorn State Univ., Mound Bayou, MS, [2]Texas A&M Univ., San Angelo, TX

10:00 **0167** Influences of chemical, mechanical, and integrative vegetation management strategies on pollinator assemblage on powerline rights-of-way in New York and Ohio. **Erica McPhail** (esmcphai@syr.edu)[1], Melissa K. Fierke[1], Christopher Nowak[1] and Scott McArt[2], [1]State Univ. of New York, Syracuse, NY, [2]Cornell Univ., Ithaca, NY

10:10 **0168** Improving parameterization of a predictive bee abundance model in a complex landscape. **Brianne Du Clos** (brianne.duclos@maine.edu), Cynthia Loftin and Frank Drummond, Univ. of Maine, Orono, ME

10:20 **0169** A preliminary study on nocturnal pollinator fruit production contribution, behavior, and community composition in Arkansas apples. **Stephen Robertson** (smr020@email.uark.edu), Erica Westerman and Neelendra Joshi, Univ. of Arkansas, Fayetteville, AR

10:30 **0170** Pollination and reproductive biology of two native orchids in Florida, *Prosthechea cochleata* and *Encyclia tampensis*. **Haleigh Ray** (hray12@ufl.edu)[1], Charles Stuhl[2] and Jennifer Gillett-Kaufman[1], [1]Univ. of Florida, Gainesville, FL, [2]USDA - ARS, Gainesville, FL

10:40 **0171** Emergence trapping for crop pollinators: Can we determine high quality nesting habitat for ground-nesting bees on Michigan blueberry farms? **Julia Brokaw** (julia.n.brokaw@gmail.com)[1], Emily May[2], Shiala Naranjo[3], Rufus Isaacs[4] and Jason Gibbs[4,5], [1]Univ. of Minnesota, St. Paul, MN, [2]The Xerces Society for Invertebrate Conservation, Portland, OR, [3]Univ. of Central Florida, Orlando, FL, [4]Michigan State Univ., East Lansing, MI, [5]Univ. of Manitoba, Winnipeg, MB, Canada

10:50 **0172** Bees in the treetops: A new spatial dimension to pollinator visitation networks. **Katherine Urban-Mead** (kru4@cornell.edu), Bryan N. Danforth and Scott McArt, Cornell Univ., Ithaca, NY

11:00 **0173** A multivariate community and scalar habitat analysis of *Anthophila* (Hymenoptera: Apoidea) in the Texas High Plains agricultural region. **Samuel Discua** (samuel.discua@ttu.edu), Nancy McIntyre and Scott Longing, Texas Tech Univ., Lubbock, TX

11:10 **0174** Novel wild bee communities of invaded forest edges. **Michael Minnick** (minnicmj@miamioh.edu) and Thomas O. Crist, Miami Univ., Oxford, OH

11:20 **0175** Natural areas increase fruit set but do not decrease pollen limitation in *Theobroma cacao*. **Emily Kearney** (eekearney@berkeley.edu)[1], Kelly Swing[2] and Claire Kremen[1], [1]Univ. of California, Berkeley, CA, [2]Univ. San Francisco de Quito, Quito, Ecuador

11:30 **0176** Impacts of dryland farming systems on bee communities and bee-flower networks in the Northern Great Plains. **Subodh Adhikari** (subodh.adhikari@msu.montana.edu), Laura A. Burkle, Kevin M. O'Neill, David K. Weaver and Fabian D. Menalled, Montana State Univ., Bozeman, MT

Undergrad 10-min: MUVE and PBT

Meeting Room 302 (Convention Center)

Moderators: Justin Talley[1] and Ashley Mortensen[2], [1]Oklahoma State Univ., Stillwater, OK, [2]Univ. of Florida, Gainesville, FL

10:00 **0177** Identifying co-circulating hemoparasites in the WNV transmission cycle in east Texas. **Dayvion Adams** (ajadams968@tamu.edu), Andrew Golnar, Matthew Medeiros and Gabriel Hamer, Texas A&M Univ., College Station, TX

10:10 **0178** Isolation of chemical resource and oviposition cues in *Calliphora vicina*. **Veena Mehta** (veena.mehta@jjay.cuny.edu)[1], Joseph Fragale[1], Jennifer Rosati[1] and Rabi Musah[2], [1]John Jay College of Criminal Justice, New York, NY, [2]State Univ. of New York, Albany, NY

10:20 **0179** Isolation of chemical oviposition and resource cues in *Lucilia sericata*. **Joseph Fragale** (joseph.fragale@jjay.cuny.edu)[1], Veena Mehta[1], Jennifer Rosati[1] and Rabi Musah[2], [1]John Jay College of Criminal Justice, New York, NY, [2]State Univ. of New York, Albany, NY

10:30 **0180** Planting the seeds of destruction. Effects of acorns on production of *Aedes* mosquitoes. **Rachel Rogers** (r.e.rogers@usm.edu) and Donald Yee, Univ. of Southern Mississippi, Hattiesburg, MS

10:40 **0181** Feeding behavior and host choice in *Aedes albopictus* and *Aedes aegypti*. **Briana Vargas** (briana.vargas01@utrgv.edu), Robert Gilkerson and Christopher Vitek, Univ. of Texas, Edinburg, TX

10:50 **0182** Mosquito abundance patterns in south Texas. **Ileana Lozano** (ileana.lozano01@utrgv.edu), Lopamudra Bhattacharya, Eleaine Barron, Jeremy Thompson, Kusy Zarzosa, Taylor Moya, Cruz Cardenas and Christopher Vitek, Univ. of Texas, Edinburg, TX

11:00 **0183** Exploring the cellular and molecular interplay between ticks and their bacterial communities. **Emma Warren** (eaw358@gmail.com)[1] and Lindsay Porter[2], [1]Northwestern State Univ., Sunset, LA, [2]Northwestern State Univ., Natchitoches, LA

11:10 **0184** The diversity of forensically important flies in Manhattan. **Hannah Chu** (hannah.chu@jjay.cuny.edu), Jennifer Rosati and Yoselin Paucar, John Jay College of Criminal Justice, New York, NY

11:20 **0185** In the fly of a hurricane: Aquatic insect recolonization of *Heliconia* systems in Puerto Rico. **Jaclyn Everly** (jaclyn.everly@usm.edu) and Donald Yee, Univ. of Southern Mississippi, Hattiesburg, MS

11:30 **0186** The effects of pyriproxyfen exposure on honey bee (*Apis mellifera*) sucrose sensitivity. **Makaylee Crone** (makaylee.crone22@tamu.edu)[1], Olalekan Falokun[1], Adrian Fisher II[1], Pierre Lau[1], Julie Mustard[2] and Juliana Rangel[1], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Texas, Brownsville, TX

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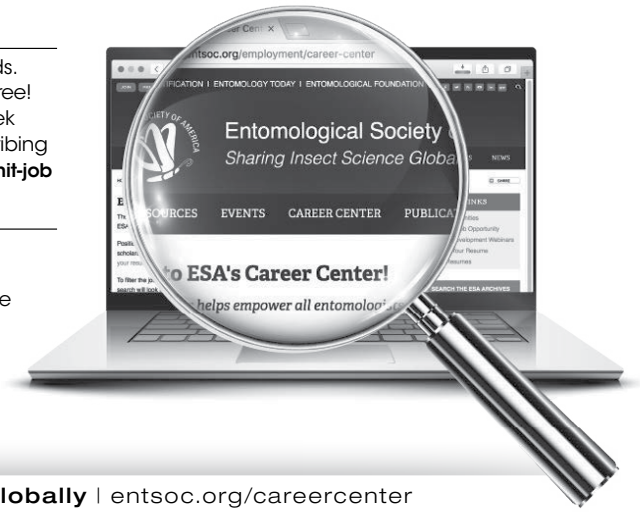

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Sunday, November 5, 2017 • AFTERNOON

Lunch and Learn: How to Talk to a Nine-Year-Old about Climate Change (and Other Tough Concepts!) Using Informal Invertebrate Education

Meeting Room 704/706 (Convention Center)

Moderators and Organizers: Marissa Copan and Mario Padilla, Butterfly Pavilion, Westminster, CO

12:15 **0187** How to talk to a nine-year-old about climate change (and other tough concepts!) using informal invertebrate education. Mario Padilla and **Marissa Copan** (mcopan@butterflies.org), Butterfly Pavilion, Westminster, CO

Lunch and Learn: To the Head of the Class: Preparing for Your First Faculty Teaching Position

Meeting Room 705/707 (Convention Center)

Moderators and Organizers: Laura Weiser Erlandson[1] and Elizabeth Butin[2], [1]Texas A&M Univ., Killeen, TX, [2]Holyoke Community College, Holyoke, MA

12:15 PM – 1:15 PM

Program Symposium: Grand Challenges: Tackling Invasive Species and Communication Strategies

Meeting Room 601/603 (Convention Center)

Moderators and Organizers: Mustapha Debboun[1], Alec Gerry[2], Peter Jensen[3], Blair Siegfried[4], Melissa Willrich Siebert[5], Mark Wright[6], Patrick Moran[7], Faith Oi[4], Chris Stelzig[8], Christopher Beatty[9], and Andrew Short[10], [1]Harris County Public Health, Houston, TX, [2]Univ. of California, Riverside, CA, [3]Monsanto Company, St. Louis, MO, [4]Univ. of Florida, Gainesville, FL, [5]Dow AgroSciences, Greenville, MS, [6]Univ. of Hawai'i, Honolulu, HI, [7]USDA - ARS, Albany, CA, [8]Entomological Society of America, Annapolis, MD, [9]Cornell Univ., Ithaca, NY, [10]Univ. of Kansas, Lawrence, KS

1:30 **Introductory Remarks by David Gammel**

1:35 **Panel Discussion Facilitated by Frank Zalom**

2:05 **0189** MUVE: Invasive potential of mites and ticks of medical and/or veterinary concern in the United States. **Joel Hutcheson** (hjoel.hutcheson@aphis.usda.gov), USDA - APHIS, Ames, IA

2:20 **0190** MUVE: The odd couple. Invasion biology, management challenges, and 21st century threats from the mosquitoes *Aedes aegypti* and *Aedes albopictus* in the United States. **Donald Yee** (donald.yee@usm.edu), Univ. of Southern Mississippi, Hattiesburg, MS

2:35 **0191** PBT: Can gene drive research provide another tool for the management of invasive species? **Omar Akbari** (omar.akbari@ucr.edu), Univ. of California, Riverside, CA

2:50 **0192** P-IE: Asian citrus psyllid and Huanglongbing: The extreme citrus challenge. **Elizabeth Grafton-Cardwell** (eegraftoncardwell@ucanr.edu), Univ. of California, Riverside, CA

3:05 **0193** PBT: Microbial ecology of Asian citrus psyllid. **Kirsten Pelz-Stelinski** (pelzstelinski@ufl.edu), Univ. of Florida, Lake Alfred, FL

3:20 **Break**

3:35 **0194** P-IE: Combating the threat posed by the invasive brown marmorated stink bug through a nationally coordinated research, outreach, and IPM program to deliver sustainable solutions to stakeholders. **Rob Morrison** (william.morrison@ars.usda.gov)[1] and Tracy C. Leskey[2], [1]USDA - ARS, Manhattan, KS, [2]USDA - ARS, Kearneysville, WV

3:50 **0195** SysEB: Pavement ants to population genomics: How citizen science can benefit invasion science. **Andrea Lucky** (alucky@ufl.edu), Univ. of Florida, Gainesville, FL

4:05 **0196** SysEB: From laboratory to field application: Simple molecular solutions for the identification and subsequent detection of cryptic invaders? **Paul F. Rugman-Jones** (paulrj@ucr.edu), Univ. of California, Riverside, CA

4:20 **0197** Scientific collaboration and communication. **Richard Stone** (stone@storywork.com), StoryWork International, Winston Salem, NC

4:50 **0188** Keynote: A view from Washington DC. **Sonny Ramaswamy** (sonny@nifa.usda.gov), USDA – NIFA, Washington, DC

5:20 **Concluding Remarks**

Workshop: Ignite, Inspire, and Innovate through Education and Outreach

Meeting Room 705/707 (Convention Center)

Moderators and Organizers: David Held[1], John Guyton[2], Ronda Hamm[3] and Michelle Smith[3], [1]Auburn Univ., Auburn, AL, [2]Mississippi State Univ., Mississippi State, MS, [3]Dow AgroSciences, Indianapolis, IN

1:30 **Introductory Remarks**

1:35 **Outreach Activity: It's in your DNA – Part 1**

2:05 **It's in your DNA – Part 1 Discussion**

2:15 **Outreach Activity: It's in your DNA – Part 2**

2:45 **It's in your DNA – Part 2 Discussion**

2:55 **Break**

3:05 **Outreach Activit: Natural selection/Crypsis**

3:35 **Natural selection/Crypsis Discussion**

3:45 **Outreach Activity: Earth without Insects**

4:15 **Earth without Insects Discussion**

4:25 **Concluding Remarks**

MUVE Section Symposium: Innovation in Research and Development of Insect Repellents

Meeting Room 404 (Convention Center)

Moderator and Organizer: Mustapha Debboun, Harris County Public Health, Houston, TX

1:30 **0198** Non-pyrethroid spatial repellents. **Joel R. Coats** (jcoats@iastate.edu), Iowa State Univ., Ames, IA

1:45 **0199** Recent progress on the development of passive spatial repellent devices at the USDA. **Daniel Kline** (dan.kline@ars.usda.gov), USDA - ARS, Gainesville, FL

2:00 **0200** Spatial insect repellent devices for the consumer market. **Qing-He Zhang** (qing-he@rescue.com), Sterling International, Inc, Spokane, WA

2:15 **0201** New natural products based mosquito repellents. **Abbas Ali** (aali@olemiss.edu), Univ. of Mississippi, University, MS

2:30 **0202** Repellency and other bilogical effects of natural substances against the sand fly, *Phlebotomus papatasi*. **Kevin B. Temeyer** (kevin.temeyer@ars.usda.gov)[1], Kristie Schlechte[1], Laryssa Dandeneau[2], Megan Davis[1], Andrew Li[3], Livio Costa-Junior[4] and Adalberto A. Pérez de León[1], [1]USDA - ARS, Kerrville, TX, [2]Schreiner Univ., Kerrville, TX, [3]USDA - ARS, Beltsville, MD, [4]Univ. Federal do Maranhão, São Luis, Brazil

2:45 **0203** Plant based products: Use and development of repellents against mosquitoes. **Junaid Rehman** (junaiddua@gmail.com), Univ. of Mississippi, University, MS

3:00 **0204** Phase 1 laboratory evaluation of new minimum risk mosquito repellent products. **John Smith** (docmx8@gmail.com) and Taylor Thrall, Florida State Univ., Panama City, FL

3:15 **Break**

3:30 **0205** New targets for repellents from proteomic analysis of tick and biting fly tarsi. **Robert Renthal** (robert.renthal@utsa.edu)[1] and Adalberto A. Pérez de León[2], [1]Univ. of Texas, San Antonio, TX, [2]USDA - ARS, Kerrville, TX

3:45 **0206** Multiple pathways for detection of repellents by mosquitoes. **Joseph Dickens** (joseph.dickens@richmond.edu), Univ. of Richmond, Richmond, VA

4:00 **0207** Targeting mosquito gustation for disruption of host feeding. **Jackson Sparks** (sparks@highpoint.edu), High Point Univ., High Point, NC

4:15 **0208** Repelling tools for agriculture. **Agenor Mafra-Neto** (president@iscatech.com), ISCA Technologies, Inc, Riverside, CA

4:30 **0209** Next repellents. **Daniel Strickman** (dan.strickman@gatesfoundation.org), Bill and Melinda Gates Foundation, Seattle, WA

4:45 **0210** Recent developments in repellent-treated uniforms. **Ulrich Bernier** (uli.bernier@ars.usda.gov), USDA - ARS, Gainesville, FL

5:00 **0211** Lemons to lemonade: Turning a disappointing transition from laboratory to human skin testing into better repellents. **Robert Bedoukian** (rhb@bedoukian.com), Karen McKenzie, Marie Maher and Lacey Jenson, Bedoukian Research, Inc, Danbury, CT

5:15 **0212** Insect repellent mixtures and combinations. **Mustapha Debboun** (mdebboun@hcphes.org), Harris County Public Health, Houston, TX

PBT Section Symposium: Chemical Innovation in the Insect World: How, Why, and What Next?

Meeting Room 303 (Convention Center)

Moderators and Organizer: Amanda Brown, Texas Tech Univ., Lubbock, TX

1:30 **Welcoming Remarks**

1:45 **0213** Molecular diversity in bacterial symbionts of insects. **Emily Mevers** (emily_mevers@hms.harvard.edu) and Jon Clardy, Harvard Medical School, Boston, MA

2:15 **0214** Presentation withdrawn

2:45 **0215** Elucidating evolutionary origins of lichenivory and chemical sequestration in tiger moths (Lepidoptera: Erebidae: Lithosiini). **Timothy Anderson** (ander472@purdue.edu) and Jennifer Zaspel, Purdue Univ., West Lafayette, IN

3:00 **0216** Gut bacteria in the spotlight: Discovery of a toxin breakdown pathway in the cabbage root fly. **Cornelia Welte** (c.welte@science.ru.nl), Radboud Univ., Nijmegen, Netherlands

3:15 **0217** From hitchhiker to bodyguard: Antibiotic-mediated egg defense by a bacterial symbiont. **Laura V. Flórez** (laflorez@uni-mainz.de)[1,2], Kirstin Scherlach[3], Paul Gaube[2], Christian Hertweck[3] and Martin Kaltenpoth[1,2], [1]Johannes Gutenberg Univ., Mainz, Germany, [2]Max Planck Institute for Chemical Ecology, Jena, Germany, [3]Leibniz Institute for Natural Products Research and Infection Biology, Jena, Germany

3:30 **Break**

3:45 **SP0218** The dose makes the poison: Honest signaling and aggression in a robber stingless bee, *Lestrimelitta niitkib*. Chase James and **James Nieh** (jnieh@ucsd.edu), Univ. of California, La Jolla, CA

3:55 **SP0219** *Solenopsis invicta* queens inhibit female sexual development, but males and mating accelerate the process, yielding successful colony foundation. **Robert Vander Meer** (bob.vandermeer@ars.usda.gov)[1], Tappey H. Jones[2] and Satya Chinta[3], [1]USDA - ARS, Gainesville, FL, [2]Virginia Military Institute, Lexington, VA, [3]Foresight Science and Technology, Gainesville, FL

4:05 **SP0220** Cis-regulatory evolution in the elongase *bond* underlies a pheromonal difference between *Drosophila* species. **Jian Pu** (pujian@msu.edu)[1], Jessa Justen[2], Joanne Yew[3] and Henry Chung[1], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Wisconsin, Madison, WI, [3]Univ. of Hawai'i, Honolulu, HI

4:15 **SP0221** Characterization of cellulases isolated from gut bacteria of *Heterotermes indicola* Wasmann (Blattodea: Rhinotermitidae). **Naveeda Qureshi** (naveedaqresh@gmail.com), Quaid-i-Azam Univ., Islamabad, Pakistan

4:25 **SP0222** Termite control through isolation, identification and characterization of bacterial species from gut of *Microtermis obesi*. **Muhammad Qureshi** (qureshienv@yahoo.com)[1] and Naveeda Qureshi[2], [1]Government College Univ., Lahore, Pakistan, [2]Quaid-i-Azam Univ., Islamabad, Pakistan

4:35 **Discussion**

5:05 **Concluding Remarks**

PBT Section Symposium: Combining Ecology, Evolution, and Genomics to Study Complex Insect Phenotypes

Meeting Room 304 (Convention Center)

Moderators and Organizers: Brendan Hunt[1], Sarah Kocher[2] and Karl Glastad[3], [1]Univ. of Georgia, Griffin, GA, [2]Princeton Univ., Princeton, NJ, [3]Univ. of Pennsylvania, Philadelphia, PA

1:30 **Introductory Remarks**

1:35 **0223** What makes beetles extra horny? Genomics of weapons size variation in Japanese rhino beetles. **Jesse Weber** (jesse.weber@mso.umt.edu)[1], Hiroki Gotoh[2], Wataru Kojima[3], Kunio Araya[4], Chung-Ping Lin[3], Laura Lavine[5] and Doug Emlen[1], [1]Univ. of Montana, Missoula, MT, [2]Nagoya Univ., Chikusa, Japan, [3]National Taiwan Normal Univ., Taipei, Taiwan, [4]Kyushu Univ., Fukuoka, Japan, [5]Washington State Univ., Pullman, WA

1:50 **0224** The nature of nurture in the burying beetle, *Nicrophorus vespilloides*. **Allen J. Moore** (ajmoore@uga.edu), Univ. of Georgia, Athens, GA

2:05 **0225** The genetic basis of a social polymorphism in *Lasioglossum albipes*. **Sarah Kocher** (skocher@gmail.com), Princeton Univ., Princeton, NJ

2:20 **0226** Genome architecture of complex social traits. **Brock Harpur** (harpur@yorku.ca), York Univ., Toronto, ON, Canada

2:35 **0227** High-resolution behavioral and molecular analyses of plasticity in queenless honey bee workers. **Beryl Jones** (bmjones2@illinois.edu), Univ. of Illinois, Champaign, IL

2:50 **Break**

3:00 **0228** The chromatin landscape of reproductive plasticity in *Harpegnathos saltator*. **Karl Glastad** (karlglastad@gmail.com), Univ. of Pennsylvania, Philadelphia, PA

3:15 **0229** Climbing the social ladder: The role of corazonin in ant caste transitions. **Janko Gospocic** (janko.gospocic@gmail.com), Univ. of Pennsylvania, Philadelphia, PA

3:30 **0230** Integrating the genetic and ecological underpinnings of social organization in *Formica* ants. **Jessica Purcell** (jessica.purcell@ucr.edu), Univ. of California, Riverside, CA

3:45 **0231** Attempts at dissecting the fire ant social supergene. **John Wang** (johnwang@gate.sinica.edu.tw), Academia Sinica, Taipei, Taiwan

4:00 **0232** Gene regulatory consequences of supergene evolution in the fire ant *Solenopsis invicta*. **Brendan Hunt** (huntbg@uga.edu), Univ. of Georgia, Griffin, GA

4:15 **Break**

4:25 **0233** Identification and evolution of a locus controlling the pea aphid wing dimorphism. **Jennifer A. Brisson** (jbrisso3@ur.rochester.edu), Univ. of Rochester, Rochester, NY

4:40 **0234** Resilience in a changing world: Integrating molecular, physiological and ecological responses to thermal stress in the ant genus *Aphaenogaster*. **Sara Helms Cahan** (scahan@uvm.edu), Univ. of Vermont, Burlington, VT

4:55 **0235** Generating the complex diapause phenotype. **David L. Denlinger** (denlinger.1@osu.edu)[1], Cheolho Sim[2] and Julie Reynolds[1], [1]The Ohio State Univ., Columbus, OH, [2]Baylor Univ., Waco, TX

5:10 **0236** Mechanisms underlying host-use variation in pine sawflies: Transcriptional profiling of chemosensory tissues. **Danielle Herrig** (danielle.herrig@uky.edu) and Catherine Linnen, Univ. of Kentucky, Lexington, KY

5:25 **Concluding Remarks**

PBT Section Symposium: Protecting Bee Pollinators with Comparative Toxicology and Functional Genomics

Meeting Room 302 (Convention Center)

Moderators and Organizers: Troy Anderson[1], Ralf Nauen[2], and Chris Bass[3], [1]Univ. of Nebraska, Lincoln, NE, [2]Bayer AG, Monheim, Germany, [3]Univ. of Exeter, Penryn, United Kingdom

1:30 **Welcoming Remarks & Introduction**

1:45 **0237** Bee genomes, detoxification mechanisms, and toxicology. **Mary Schuler** (maryschu@illinois.edu), Univ. of Illinois, Champaign, IL

2:00 **0238** A view across the landscape of cytochrome P450 genes in 10 bee genomes. **Reed Johnson** (johnson.5005@osu.edu), The Ohio State Univ., Wooster, OH

2:15 **0239** The *Osmia* genome uncovers evolutionary conserved detoxification principles. Kumar Singh[1], Katherine Beadle[1], Ralf Nauen[2] and **Chris Bass** (c.bass@exeter.ac.uk)[1], [1]Univ. of Exeter, Penryn, United Kingdom, [2]Bayer AG, Monheim, Germany

2:30 **0240** P450-mediated detoxification of insecticides by the solitary bee *Osmia bicornis*. **Katherine Beadle** (k.beadle@exeter.ac.uk)[1], Bartek Troczka[2], Rebecca Reid[2], T. G. Emyr Davies[2], Lin Field[2], Martin Williamson[2], Ralf Nauen[3] and Chris Bass[1], [1]Univ. of Exeter, Penryn, United Kingdom, [2]Rothamsted Research, Harpenden, United Kingdom, [3]Bayer AG, Monheim, Germany

2:45 **Break**

3:00 **0241** Proteomic and metabolomic analysis reveals rapid and extensive nicotine detoxification ability in honey bees. **Esther du Rand** (ezette.durand@up.ac.za), Susan Nicolson, Christian Pirk and Zeno Apostolides, Univ. of Pretoria, Pretoria, South Africa

3:15 **0242** Exploring *Bombus terrestris* P450ome: Insights into insecticide metabolism. **Bartek Troczka** (bartek.troczka@rothamsted.ac.uk), Rothamsted Research, Harpenden, United Kingdom

3:30 **0243** Molecular determinants of neonicotinoid selectivity in *Apis mellifera*. **Ralf Nauen** (ralf.nauen@bayer.com)[1], Marion Zaworra[1], Bettina Lueke[1], Gillian Hertlein[1], Chris Bass[2] and Lin Field[3], [1]Bayer AG, Monheim, Germany, [2]Univ. of Exeter, Penryn, United Kingdom, [3]Rothamsted Research, Harpenden, United Kingdom

3:45 **SP0244** Influence of imidacloprid versus kaolin on honey bee foraging behavior and natural enemy assemblages. **Vonny Barlow** (vmbarlow@ucdavis.edu)[1] and Joan Leong[2], [1]Univ. of California, Davis, CA, [2]California State Polytechnic Univ., Pomona, CA

3:55 **0245** Novel acaricide actives for bee colony protection. **Troy Anderson** (tanderson44@unl.edu), Univ. of Nebraska, Lincoln, NE

4:10 **0246** Amitraz and its metabolite modulate honey bee cardiac function and tolerance to viral infection. **Scott O'Neal** (soneal3@unl.edu)[1], Carlyle Brewster[2], Jeffrey Bloomquist[3] and Troy Anderson[1], [1]Univ. of Nebraska, Lincoln, NE, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [3]Univ. of Florida, Gainesville, FL

4:25 **SP0247** Practical considerations in pesticide risk assessment on honey bees. **Yu Cheng Zhu** (yc.zhu@ars.usda.gov)[1], Jianxiu Yao[1,2] and John Adamczyk[3], [1]USDA - ARS, Stoneville, MS, [2]Kansas State Univ., Manhattan, KS, [3]USDA - ARS, Poplarville, MS

4:35 **Panel Session & Discussion**

P-IE Section Symposium: Celebrating a Centennial of Corn Borers: What Have We Learned Since the Introduction?

Meeting Room 403 (Convention Center)

Moderators and Organizers: Rebecca Schmidt-Jeffris[1] and Ana Vélez[2], [1]Clemson Univ., Charleston, SC, [2]Univ. of Nebraska, Lincoln, NE

1:30 **0248** Scouting, quarantine and control for the European corn borer, 1917-1926. **Von Kaster** (von.kaster@syngenta.com)[1], Marlin Rice[2] and Thomas Sappington[3], [1]Syngenta Seeds, Slater, IA, [2]Syngenta Crop Protection, Research Triangle Park, NC, [3]USDA - ARS, Ames, IA

1:45 **0249** Sex pheromone olfactory pathways related to pheromone-mediated behavior of the European corn borer. **Thomas C. Baker** (tcb10@psu.edu), Pennsylvania State Univ., University Park, PA

2:00 **0250** Molecular mechanisms underlying the evolution of sex pheromone communication in the *Ostrinia*. **Kevin Wanner** (kwanner@montana.edu), Jean E. Allen and Brent Herdlicka, Montana State Univ., Bozeman, MT

2:30 **0251** It's not that EZ: Life histories of the E and Z European corn borer pheromone races. **Holly Lynn Walker** (hollylyn@udel.edu) and Charles Mason, Univ. of Delaware, Newark, DE

2:45 **0252** (Stanley) Beck to the future: Development and seasonal biology of *Ostrinia nubilalis*. **Erik Dopman** (erik.dopman@tufts.edu)[1], Genevieve Kozak[1] and Brad Coates[2], [1]Tufts Univ., Medford, MA, [2]USDA - ARS, Ames, IA

3:00 **0253** Climate oscillation and insect fitness: One hundred years of *Ostrinia nubilalis* in North America. **Daniel Olmstead** (dlo6@cornell.edu), Cornell Univ., Geneva, NY

3:15 **0254** Regional suppression of *Ostrinia nubilalis* due to Bt corn and its effects on other crops in the Mid-Atlantic U.S. **Galen Dively** (galen@umd.edu)[1], P. Dilip Venugopal[2], Richard Bean[3], Joanne Whalen[4], Kristian Holmstrom[5], Gerald Ghidiu[6], Thomas Kuhar[7], Hélène Doughty[8] and William Hutchison[9], [1]Univ. of Maryland, College Park, MD, [2]U.S. Environmental Protection Agency, Washington, DC, [3]Maryland Dept. of Agriculture, Annapolis, MD, [4]Univ. of Delaware, Newark, DE, [5]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [6]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ, [7]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [8]Virginia Polytechnic Institute and State Univ., Virginia Beach, VA, [9]Univ. of Minnesota, St. Paul, MN

3:30 **Break**

3:45 **0255** Balancing areawide suppression and IRM for European corn borer management in the Midwest U.S.: Influence of declining Bt corn use and farmer decision-making. **William D. Hutchison** (hutch002@umn.edu)[1], Eric C. Burkness[1], Krista Hamilton[2], Paul D. Mitchell[3], Roger Moon[1], Alice Milne[4] and James Bell[4], [1]Univ. of Minnesota, St. Paul, MN, [2]Wisconsin Dept. of Trade, Agriculture, and Consumer Protection, Madison, WI, [3]Univ. of Wisconsin, Madison, WI, [4]Rothamsted Research, Harpenden, United Kingdom

4:00 **0256** Bottom's up for Bt: Below-ground effects complicate the corn borer story. **Rebecca Schmidt-Jeffris** (rschmi3@clemson.edu)[1], Kyle Wickings[2], Erica Moretti[3], Michael Wolfin[2] and Brian Nault[2], [1]Clemson Univ., Charleston, SC, [2]Cornell Univ., Geneva, NY, [3]Allegheny College, Meadville, PA

4:15 **0257** Host preference by *Ostrinia nubilalis* females on maize: The role of microbial inoculum. **Joseph Disi** (jod0003@auburn.edu)[1], Simon Zebelo[2], Joseph Kloepper[1] and Henry Fadamiro[1], [1]Auburn Univ., Auburn, AL, [2]Univ. of Maryland, Princess Anne, MD

4:30 **0258** Twenty one-years of Bt resistance monitoring for European corn borer: What have we learned? **Ana Vélez** (avelezarango2@unl.edu)[1], Miles Lepping[2], Paula A. Price[3] and Blair Siegfried[4], [1]Univ. of Nebraska, Lincoln, NE, [2]Dow AgroSciences, Indianapolis, IN, [3]Monsanto Company, St. Louis, MO, [4]Univ. of Florida, Gainesville, FL

4:45 **0259** Susceptibility of *Ostrinia nubilalis* populations to the pyrethroid bifenthrin in the United States. **Débora Montezano** (deiagm@gmail.com)[1], Thomas Hunt[2], Julie Peterson[3], Adriano Pereira[4] and Ana Vélez[1], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, Concord, NE, [3]Univ. of Nebraska, North Platte, NE, [4]Univ. of Missouri, Columbia, MO

5:00 **0260** European corn borer management – An industry perspective. **Miles Lepping** (mdlepping@dow.com)[1], Marlin Rice[2], Matthew Carroll[3], Clinton Pilcher[4], Chris Sansone[5], Nicholas Storer[1], Isaac/Olatunji Oyediran[2], Graham P. Head[3], Rachel R. Binning[6], Timothy Dennehy[5], Ana Vélez[7] and Blair Siegfried[8], [1]Dow AgroSciences, Indianapolis, IN, [2]Syngenta Crop Protection, Research Triangle Park, NC, [3]Monsanto Company, St. Louis, MO, [4]DuPont Pioneer, Johnston, IA, [5]Bayer CropScience, Research Triangle Park, NC, [6]Pioneer Hi-Bred International, Inc, Johnston, IA, [7]Univ. of Nebraska, Lincoln, NE, [8]Univ. of Florida, Gainesville, FL

P-IE Section Symposium: Climate and Forest Insect Outbreaks: Linking Climate, Tree Physiology, and Insect Demography

Meeting Room 712 (Convention Center)

Moderator and Organizer: Devin Goodsman, Los Alamos National Laboratory, Los Alamos, NM

1:30 **Welcoming Remarks**

1:45 **0261** Assessing the potential for persistence: Invasive mountain pine beetle populations in novel pine forests of Alberta. **Stanley Pokorny** (spokorny@mail.ubc.ca), Univ. of British Columbia, Vancouver, BC, Canada

2:00 **0262** Bark beetle (*Ips confuses*) attack is critical to mortality of pinon pine (*Pinus edulis*). **Nate McDowell** (nate.mcdowell@pnnl.gov), Pacific Northwest National Laboratory, Richland, WA

2:15 **0263** The physiological basis for recognition of the mountain pine beetle as an invasive species. **Jordan Burke** (jordan.lewis.burke@gmail.com), Univ. of British Columbia, Vancouver, BC, Canada

2:30 **Break**

2:45 **0264** Phytochemical factors affecting the activities of mountain pine beetle-vectored fungi in a novel host pine. **Jonathan Cale** (jacale@ualberta.ca), Univ. of Alberta, Edmonton, AB, Canada

3:00 **0265** How a warming climate facilitates outbreaks of eastern larch beetle *Dendroctonus simplex* by altering demography. **Brian Aukema** (brianaukema@umn.edu), Univ. of Minnesota, St. Paul, MN

3:15 **0266** Milestones in the development of an insect outbreak model for use in earth system models: Integrating thermal biology, demography, and plant-insect interactions. **Chonggang Xu** (cxu@lanl.gov) and Devin Goodsman, Los Alamos National Laboratory, Los Alamos, NM

3:30 **0267** Succumbing to invasion: Novel hosts of mountain pine beetle lack defense chemicals that drive survival of historical host trees during mountain pine beetle outbreak. **Nadir Erbilgin** (erbilgin@ualberta.ca), Univ. of Alberta, Edmonton, AB, Canada

3:45 **0268** The role of cold temperatures in spatiotemporal patterns of larch casebearer. **Samuel J. Fahrner** (fahr0051@umn.edu)[1], Robert Venette[2] and Brian Aukema[1], [1]Univ. of Minnesota, St. Paul, MN, [2]USDA - Forest Service, St. Paul, MN

4:00 **SP0269** The effect of forest fire severity on host plant quality and insect herbivore damage. **Shannon Murphy** (shannon.m.murphy@du.edu), Timmy Smith, Dexter Rowland, Claudia Hallagan, Mayra Vidal, E. Dale Broder, Elizabeth Barnes and Laurel C. Cepero, Univ. of Denver, Denver, CO

4:10 **SP0270** Ecological effects of regional agricultural landscape on insects in northern China. **Feng Ge** (gef@ioz.ac.cn), Chinese Academy of Sciences, Beijing, China

4:20 **SP0271** Monitoring storm-induced population levels of the spruce bark beetle (*Ips typographus* L.) in a conserved boreal forest. **Päivi Lyytikäinen-Saarenmaa** (paivi.lyytikainen-saarenmaa@helsinki.fi), Jaana Turunen and Juho Kokkonen, Univ. of Helsinki, Helsinki, Finland

4:30 **Discussion**

4:45 **Concluding Remarks**

P-IE Section Symposium: New Directions in Indirect Defense: A Continuum of Plant Control over Tri-Trophic Interactions

Meeting Room 502 (Convention Center)

Moderator and Organizer: Ian Pearse, U.S. Geological Survey, Fort Collins, CO

1:30 **Introductory Remarks**

1:35 **0272** Indirect defense: The interface of antagonism and mutualism. **Judith L. Bronstein** (judieb@email.arizona.edu), Univ. of Arizona, Tucson, AZ

2:05 **0273** Integrating predator behavior into sticky plant indirect defense, testing theoretical predictions. **Eric LoPresti** (lopresti.eric@gmail.com), Univ. of California, Davis, CA

2:20 **0274** The macroevolution of mite defense: Tiny bodyguards on the tree of life. **Marjorie Weber** (marjorie.gail@gmail.com), Michigan State Univ., East Lansing, MI

2:35 **0275** Herbivores as plant mutualists and other stories from the convoluted world of indirect effects. **Micky Eubanks** (m-eubanks@tamu.edu), Texas A&M Univ., College Station, TX

2:50 **0276** Who's smelling who? Bi-directional signaling and implications for tri-trophic chemical ecology. **Jared Ali** (jga8@psu.edu), Pennsylvania State Univ., University Park, PA

3:05 **0277** Pleiotropic plant traits and the evolution of indirect defense. **Ian Pearse** (ipearse@usgs.gov), U.S. Geological Survey, Fort Collins, CO

3:20 **Break**

3:30 **0278** Heat waves, indirect defenses, and the dynamics of tri-trophic interactions. **William Wetzel** (william.wetzel@gmail.com), Michigan State Univ., East Lansing, MI

3:45 **0279** A sticky-situation: Taking advantage of a protective mutualism in an agronomically important crop. **Peter Nelson** (pnnelson@ncsu.edu), Hannah Burrack and Clyde E. Sorenson, North Carolina State Univ., Raleigh, NC

4:00 **0280** Interactions between webworm herbivores and pollinator guilds lead to indirect effects on cowparsnip fitness. **Paul Ode** (paul.ode@colostate.edu), Colorado State Univ., Fort Collins, CO

4:15 **0281** New perspectives in a classic system: Tri-trophic interactions involving hornworms and nightshades. **Ian Kaplan** (ikaplan@purdue.edu), Purdue Univ., West Lafayette, IN

4:30 **0282** The role of plant traits in driving the foraging behavior of generalist predators. Colleen Nell, Annika Nelson, Jordan Croy and **Kailen Mooney** (mooneyk@uci.edu), Univ. of California, Irvine, CA

4:45 **0283** Phytochemistry, trophic exchange, and indirect defense in context. **Elizabeth Pringle** (epringle@unr.edu), Univ. of Nevada, Reno, NV

5:00 **0284** Tri-trophic interactions over microbial and nutritional gradients. **Robert Schaeffer** (schaeffer.robert@gmail.com), Carmen Blubaugh and William Snyder, Washington State Univ., Pullman, WA

5:15 **Panel Discussion**

SysEB Section Symposium: Revelations from Insect Transcriptomics

Meeting Room 702 (Convention Center)

Moderator and Organizer: Matan Shelomi, National Taiwan Univ., Taipei, Taiwan

1:30 **Welcoming Remarks**

1:35 **0285** Harnessing transcriptomics to study our favorite insects. **Joanna Chiu** (jcchiu@ucdavis.edu), Univ. of California, Davis, CA

2:05 **0286** Transcriptomics to estimate the systematic relationships of Odonata. **Jessica Ware** (jessicaleeware@gmail.com)[1], Harald Letsch[2], Karen Meusemann[3], Alexander Blanke[3], Manpreet Kohli[4] and Carola Greive[3], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Univ. of Vienna, Vienna, Austria, [3]Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany, [4]Rutgers, The State Univ. of New Jersey, Newark, NJ

2:20 **0287** Comparative transcriptomics in non-model solitary and eusocial bees. **Cameron Fay** (cfay@iastate.edu)[1], Amy Toth[1] and Sandra Rehan[2], [1]Iowa State Univ., Ames, IA, [2]Univ. of Pennsylvania, Philadelphia, PA

2:35 **0288** From venoms to virulence factors - Revealing ecological and evolutionary insights with RNA-seq. **Amber Paulson** (amber.rose.paulson@gmail.com)[1,2], Steve J. Perlman[3], Patrick von Aderkas[3], Mark Hurst[1], Maureen O'Callaghan[1], Xue-Xian Zhang[2] and Paul Rainey[2], [1]AgResearch Ltd. Lincoln Research Centre, Christchurch, New Zealand, [2]Massey Univ., Auckland, New Zealand, [3]Univ. of Victoria, Victoria, BC, Canada

SD0289 Coding and long non-coding RNAs regulating the adult migratory locust (*Locusta migratoria*) brain polyphenism revealed by whole transcriptome analyses. **Phuong Nguyen** (phuongnguyenvspt@gmail.com), Hallym Univ., Anyang, South Korea

SD0290 The metabolites differences between solitary and gregarious phase locusts revealed by metabolomic analysis. **A-Young Kim** (kilenay@hanmail.net), Seoul National Univ., Seoul, South Korea

SD0291 Mosquito proboscis development and evolution. **Samuel DeGrey** (spd136@humboldt.edu)[1] and Steve Davis[2], [1]Humboldt State Univ., Arcata, CA, [2]American Museum of Natural History, New York, NY

SD0292 Comparative analysis of *Aphis gossypii* transcriptome during susceptible and resistant host interactions. Sampurna Sattar[1], **Jennifer Halterman** (jlh6300@psu.edu)[1], Charles Addo-Quaye[2] and Gary A. Thompson[1], [1]Pennsylvania State Univ., University Park, PA, [2]Lewis-Clark State College, Lewistown, ID

2:50 **Break and Poster Session**

3:05 **0293** Integrating classical genetics with next-generation sequencing to study resistance to Cry2Ab in pink bollworm, *Pectinophora gossypiella*. **Lolita Mathew** (lolita.mathew@ars.usda.gov)[1], Yves Carriere[2], Xianchun Li[2], Bruce Tabashnik[2] and Jeffrey A. Fabrick[1], [1]USDA - ARS, Maricopa, AZ, [2]Univ. of Arizona, Tucson, AZ

3:20 **0294** CYPomes in the era of transciptomics. **Bernarda Calla** (calla2@illinois.edu), May Berenbaum and Mary A. Schuler, Univ. of Illinois, Champaign, IL

3:35 **0295** Transcriptome profiling of cellulase gene expression in response to different cellulose diets. **Ratnasri Mallipeddi** (rmallipe@vols.utk.edu)[1], William Klingeman[1], Margaret Staton[1], Brian Johnson[2] and Juan Luis Jurat-Fuentes[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Univ. of California, Davis, CA

3:50 **0296** Model envy: Developing molecular resources for a non-model hemipteran pest (*Lygus hesperus*). Joe Hull[1], **Erica Tassone** (erica.tassone@ars.usda.gov)[1], Scott Geib[2], Colin Brent[1] and Jeffrey A. Fabrick[1], [1]USDA - ARS, Maricopa, AZ, [2]USDA - ARS, Hilo, HI

4:05 **0297** Appendices no longer – Using RNA-seq to help identify functions in unknown organs. **Matan Shelomi** (mshelomi@ntu.edu.tw), National Taiwan Univ., Taipei, Taiwan

4:20 **Break and Continued Poster Session**

4:30 **SP0298** Feeling the heat: Gene expression and thermal tolerance across elevation and latitude in a widespread montane bumble bee. **Meaghan Pimsler** (mlpimsler@gmail.com)[1], Kennan Oyen[2], James Herndon[3], Michael E. Dillon[2], James Strange[4] and Jeffrey Lozier[1], [1]Univ. of Alabama, Tuscaloosa, AL, [2]Univ. of Wyoming, Laramie, WY, [3]Utah State Univ., Logan, UT, [4]USDA - ARS, Logan, UT

4:40 **SP0299** Transcriptome and proteome analyses reveal complex mechanisms of reproductive diapauses in the two-spotted spider mite, *Tetranychus urticae*. **Xiao-Yue Hong** (xyhong@njau.edu.cn), Jing-Yu Zhao and Si-Xia Yang, Nanjing Agricultural Univ., Nanjing, China

4:50 **SP0300** Phylogenomics of cockroaches (Blattodea). **Dominic Evangelista** (dominicev@gmail.com)[1], Benjamin Wipfler[2], Karen Meusemann[3], Sabrina Simon[4] and Frederic Legendre[1], [1]Muséum National d'Histoire Naturelle, Paris, France, [2]Friedrich-Schiller-Univ., Jena, Germany, [3]Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany, [4]Wageningen Univ., Wageningen, Netherlands

5:00 **SP0301** RNAi knockdown and evolutionary analysis of genes essential to the bombardier beetle's explosive chemical weaponry (*Brachinus elongatulus*). **Aman Gill** (amango@gmail.com)[1], Tanya Renner[2], Wendy Moore[3], Reilly McManus[3], Athula Attygalle[4] and Kipling Will[1], [1]Univ. of California, Berkeley, CA, [2]San Diego State Univ., San Diego, CA, [3]Univ. of Arizona, Tucson, AZ, [4]Stevens Institute of Technology, Hoboken, NJ

5:10 **SP0302** Gene co-expression networks can lead to new insights into condition-dependent sexual dimorphism. **Antonino Malacrinò** (antonino.malacrino@gmail.com) and Urban Friberg, Linköping Univ., Linköping, Sweden

5:20 **SP0303** Comparative brain gene expression in early insect societies and the role of experience and aggression in social dominance. **Michael Steffen** (michael.steffen@unh.edu) and Sandra Rehan, Univ. of New Hampshire, Durham, NH

Member Symposium: Entomology and Extension: Presenting Research Findings to Clientele

Meeting Room 501 (Convention Center)

Moderator and Organizer: Matthew VanWeelden, Univ. of Florida, Belle Glade, FL

1:30 **Welcoming Remarks**

1:35 **0304** Community engagement on a national scale: Building a successful extension program as a component of a USDA multi-state project. **Alec Gerry** (alec.gerry@ucr.edu), Univ. of California, Riverside, CA

2:05 **0305** Breaking idiosyncrasies to deliver entomological research findings through extension programs. **Raul T. Villanueva** (raul.villanueva@uky.edu), Univ. of Kentucky, Princeton, KY

2:20 **0306** Economic and social science are useful to preserve common pool resources, such as insecticide susceptibility provided by a non-Bt refuge. **Dominic Reisig** (dominic_reisig@ncsu.edu)[1] and Zachary Brown[2], [1]North Carolina State Univ., Plymouth, NC, [2]North Carolina State Univ., Raleigh, NC

2:35 **0307** Olives (*Olea europaea*) a new potential crop in Florida: Determining grower needs to inform research plans and extension deliverables. **Jennifer Gillett-Kaufman** (gillett@ufl.edu)[1] and Sandra A. Allan[2], [1]Univ. of Florida, Gainesville, FL, [2]USDA - ARS, Gainesville, FL

2:50 **0308** In-field demonstration of pest management practices in Arkansas. **Nicholas Seiter** (nseiter@uaex.edu)[1], Gus Lorenz[2], Glenn Studebaker[3] and Michael Chaney[2], [1]Univ. of Arkansas, Monticello, AR, [2]Univ. of Arkansas, Lonoke, AR, [3]Univ. of Arkansas, Keiser, AR

3:05 **0309** Planning for success: Keys to an effective extension career. **Suhas Vyavhare** (suhas.vyavhare@ag.tamu.edu)[1] and Charles Allan[2], [1]Texas A&M Univ., Lubbock, TX, [2]Texas A&M Univ., San Angelo, TX

3:20 **Break**

3:40 **0310** Sugarcane aphid management in sorghum, a Louisiana extension success story. **Sebe Brown** (sbrown@agcenter.lsu.edu)[1] and David Kerns[2], [1]Louisiana State Univ., Winnsboro, LA, [2]Texas A&M Univ., College Station, TX

3:55 **0311** The challenges and benefits of connecting with independent crop consultants: Perspectives from the Louisiana sugarcane industry. **Blake Wilson** (bwils26@lsu.edu), Louisiana State Univ., St. Gabriel, LA

4:10 **0312** Extending your reach in urban areas using multiple methods. **Jody Green** (jgreen17@unl.edu)[1] and Jonathan Larson[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, Omaha, NE

4:25 **0313** Purdue Extension Service through the annual pest management conference. **Adam Salyer** (asalyer@purdue.edu) and Gary Bennett, Purdue Univ., West Lafayette, IN

4:40 **0314** Addressing a pest outbreak in California rice through an extension-industry partnership. **Luis Espino** (laespino@ucanr.edu)[1], Roberta Firoved[2] and James Morris[2], [1]Univ. of California Cooperative Extension, Colusa, CA, [2]California Rice Commission, Sacramento, CA

4:55 **0315** Integrating learning technology applications and extension materials. **Terri Billeisen** (tlhoctor@ncsu.edu), North Carolina State Univ., Raleigh, NC

5:10 **0316** Outbreak of locally acquired Zika virus in Miami-Dade County—UF/IFAS extension's response. **Matthew VanWeelden** (mvanweel1@ufl.edu)[1], Frank Dowdle[1] and William Schall[2], [1]Univ. of Florida, Belle Glade, FL, [2]Univ. of Florida, West Palm Beach, FL

5:25 **Concluding Remarks**

Member Symposium: Functional Genomics of Insects Via Targeted Genome Editing

Meeting Room 301 (Convention Center)

Moderators and Organizers: Omaththage Perera[1] and Paul Shirk[2], [1]USDA - ARS, Stoneville, MS, [2]USDA - ARS, Gainesville, FL

1:30 **Introductory Remarks**

1:35 **0317** The *Wnt* beneath my wings: Exploring butterfly pattern formation in the CRISPR era. **Arnaud Martin** (heliconiuswing@gmail.com)[1], Anyimilehidi Mazo-Vargas[2], Carolina Concha[3], Richard Wallbank[4], Luca Livraghi[5], Linlin Zhang[6], Robert Reed[6], Nipam Patel[7], W. O. McMillan[8] and Virginie Courtier-Orgogozo[9], [1]George Washington Univ., Washington, DC, [2]Univ. of Puerto Rico, Mayaguez, PR, [3]Smithsonian Tropical Research Institute, Panama City, Panama, [4]Univ. of Cambridge, Cambridge, United Kingdom, [5]Oxford Brookes Univ., Oxford, United Kingdom, [6]Cornell Univ., Ithaca, NY, [7]Univ. of California, Berkeley, CA, [8]Smithsonian Tropical Research Institute, Gamboa, Panama, [9]Univ. Paris Diderot, Paris, France

2:05 **0318** Can Cas9-mediated gene editing uncover the function of the elusive *Medea* element? Nathaniel Grubbs, Nicole Gutzmann, William Klobasa, Fu-Chyun Chu, Lauren Slayton and **Marcé Lorenzen** (marce_lorenzen@ncsu.edu), North Carolina State Univ., Raleigh, NC

2:20 **0319** Functional analysis of half ABCs as a case study in *Helicoverpa armigera*. **Sher Khan** (skhan@ice.mpg.de), Michael Reichelt and David Heckel, Max Planck Institute for Chemical Ecology, Jena, Germany

2:35 **0320** Not seeing red? CRISPR guided gene disruption of the *Tribolium castaneum* aspartate 1-decarboxylase (*TcADC*) gene generates a black cuticle phenotype. **Sherry Adrianos** (sherry.adrianos@ars.usda.gov)[1], Lindsey Perkin[1], Marcé Lorenzen[2] and Brenda Oppert[1], [1]USDA - ARS, Manhattan, KS, [2]North Carolina State Univ., Raleigh, NC

2:50 **0321** CRISPR/Cas9 editing of the codling moth *CpomOR1* gene affects egg production and viability. **Stephen F. Garczynski** (steve.garczynski@ars.usda.gov) and William Rodney Cooper, USDA - ARS, Wapato, WA

3:05 **0322** Induction of Vermillion in pyralid moths using CRISPR mutagenesis. **Paul Shirk** (paul.shirk@ars.usda.gov)[1], Arnaud Martin[2], Nipam Patel[3], Bryce Shirk[1] and Richard B. Furlong[1], [1]USDA - ARS, Gainesville, FL, [2]George Washington Univ., Washington, DC, [3]Univ. of California, Berkeley, CA

3:20 **0323** Social caste determination in honey bees via genome-editing. **Hongmei Li-Byarlay** (hlibyar@ncsu.edu)[1], Micheline Strand[2], David Tarpy[3] and Olav Rueppell[4], [1]Central State Univ., Wilberforce, OH, [2]Chemical and Biological Defense Laboratories, Durham, NC, [3]North Carolina State Univ., Raleigh, NC, [4]Univ. of North Carolina, Greensboro, NC

3:35 **Break**

3:50 **0324** Treatments for targeting bacteria and psyllids in citrus trees. **Wayne Hunter** (wayne.hunter@ars.usda.gov)[1], Jackie Metz[2], Andres Sandoval-Mojica[2], Sidney Altman[3], Michael Boyle[4], Veenu Aishwarya[5], Greg McCollum[1] and Kirsten Pelz-Stelinski[2], [1]USDA - ARS, Fort Pierce, FL, [2]Univ. of Florida, Lake Alfred, FL, [3]Yale Univ., New Haven, CT, [4]Smithsonian Marine Station, Fort Pierce, FL, [5]AUM LifeTech, Philadelphia, PA

4:05 **0325** CRISPR/CAs9 mediated targeted gene editing for functional genomics in the bollworm, *Helicoverpa zea*. **Omaththage Perera** (op.perera@ars.usda.gov)[1], Nathan Little[1], Calvin Pierce[1], Heba Abdelgaffar[2], Lin Niu[2], Randall Luttrell[1] and Juan Luis Jurat-Fuentes[2], [1]USDA - ARS, Stoneville, MS, [2]Univ. of Tennessee, Knoxville, TN

4:20 **0326** Comparison of natural and artificial gene drives. **Michael J. Wade** (mjwade@indiana.edu) and Gabriel Zentner, Indiana Univ., Bloomington, IN

4:50 **Panel Discussion**

5:20 **Concluding Remarks**

Member Symposium: Innovations and Upcoming Challenges to Manage Insects in Greenhouses

Meeting Room 708 (Convention Center)

Moderators and Organizers: Luis A. Cañas[1] and Erfan Vafaie[2], [1]The Ohio State Univ., Wooster, OH, [2]Texas A&M Univ., Overton, TX

1:30 **Introductory Remarks**

1:35 **0327** Discovery and implementation of native strains of *Metarhizium* spp. against lepidopteran pests. **Eric Rebek** (eric.rebek@okstate.edu)[1], Stephen M. Marek[1] and Jose Rodriguez-Contreras[2], [1]Oklahoma State Univ., Stillwater, OK, [2]Univ. Autónoma Agraria Antonio Narro, Saltillo, Mexico

1:50 **0328** Management options for greenhouse pests that protect pollinators. **Cristi L. Palmer** (palmer@aesop.rutgers.edu)[1], James A. Bethke[2], Juang-Horng Chong[3], Daniel Gilrein[4] and David R. Smitley[5], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Univ. of California Cooperative Extension, San Diego, CA, [3]Clemson Univ., Clemson, SC, [4]Long Island Horticultural Research and Extension Center, Riverhead, NY, [5]Michigan State Univ., East Lansing, MI

2:05 **0329** Measuring tri-trophic impacts of neonicotinoids on green peach aphid and its predators. **Erick Martinez** (erick.j.m95@gmail.com)[1], Carlos Esquivel[2], Andrew Michel[2] and Luis A. Cañas[2], [1]Zamorano Univ., Tegucigalpa, Honduras, [2]The Ohio State Univ., Wooster, OH

2:20 **0330** Investigating tritrophic interactions of aphid biological control on *Calibrachoa* spp. **John P. Sanderson** (jps3@cornell.edu), Liza White and Priscilla Thompson, Cornell Univ., Ithaca, NY

2:35 **Break**

2:45 **0331** Effects of pesticides on the survival of rove beetle, *Dalotia coriaria*, and insidious flower bug, *Orius insidiosus*, adults. **Raymond Cloyd** (rcloyd@ksu.edu) and Nathan Herrick, Kansas State Univ., Manhattan, KS

3:00 **0332** Scale IPM in greenhouses and landscapes. **Erfan Vafaie** (erfanv@tamu.edu)[1], Michael Merchant[2], Yan Chen[3] and Mengmeng Gu[4], [1]Texas A&M Univ., Overton, TX, [2]Texas A&M Univ., Dallas, TX, [3]Louisiana State Univ., Hammond, LA, [4]Texas A&M Univ., College Station, TX

3:15 **0333** New tools for management of insect and mite pests in ornamentals. **Carlos Bogran** (cbogran@ohp.com), OHP Inc, College Station, TX

3:30 **0334** The use of entomopathogenic nematodes in vegetable production systems. **Rogelio Trabanino** (rtrabanino@zamorano.edu), Escuela Agricola Panamericana, Tegucigalpa, Honduras

3:45 **Discussion**

4:00 **0335** Addressing challenges in managing arthropod pests of southern greenhouses. **Kevin Heinz** (kmheinz@tamu.edu) and Steven Arthurs, Texas A&M Univ., College Station, TX

4:15 **0336** Applied biological control in greenhouses – Current status and experiences from users. **Suzanne Wainwright** (buglady@bugladyconsulting.com), Buglady Consulting, Slatingon, PA

4:30 **0337** Why so blue? Optimizing mass trapping of western flower thrips in Canadian greenhouses. **Sarah Jandricic** (sejandri@ncsu.edu) and Mitchell Eicher-Sodo, Ontario Ministry of Agriculture, Ontario, ON, Canada

4:45 **Concluding Remarks and Business Meeting**

Member Symposium: Into the Wilderness: Studies of Staphylinidae

Meeting Room 704/706 (Convention Center)

Moderators and Organizers: Michael Ferro[1] and Brittany Owens[2], [1]Clemson Univ., Clemson, SC, [2]Louisiana State Univ., Baton Rouge, LA

1:30 **Introductory Remarks**

1:32 **Welcoming Remarks**

1:35 **0338** The travails of working with hyperdiverse little brown beetles - Subgenus *Napochus* of *Euconnus* (Coleoptera: Staphylinidae: Scydmaeninae). **Donald Chandler** (donald.chandler@unh.edu)[1], Sean O'Keefe[2] and Edward G. Riley[3], [1]Univ. of New Hampshire, Durham, NH, [2]Morehead State Univ., Morehead, KY, [3]Texas A&M Univ., College Station, TX

1:50 **0339** Towards the phylogenetic relationships of the genus *Batrisodes* Reitter (Staphylinidae: Pselaphinae) in North America, north of Mexico. **Laura Vasquez-Velez** (lvasque@clemson.edu), Clemson Univ., Clemson, SC

2:05 **0340** The *Arianops* mystery deepens with soil depth: Why a rarely collected genus of staphylinids might be everywhere. **Christopher E. Carlton** (ccarlt@lsu.edu), Louisiana State Univ., Baton Rouge, LA

2:20 **0341** Phylogeny and sister-group relationships of the rove beetle tribe Xantholinini with implications for higher classification of the family. **Dagmara Zyla** (zyladagmara@gmail.com), Natural History Museum, Copenhagen, Denmark

2:35 **0342** The Pselaphini of New Zealand: Broun and back again. **Brittany Owens** (brittanyeowens@gmail.com), Louisiana State Univ., Baton Rouge, LA

2:50 **0343** A survey of the Omaliinae. **Logan Mullen** (ljmullen2@alaska.edu), Univ. of Alaska, Fairbanks, AK

3:05 **0344** Phylogeny and evolution of the coastal *Aleochara* Gravenhorst (Coleoptera: Staphylinidae: Aleocharinae). **Jeong-Hun Song** (jhsong0817@gmail.com) and Kee-Jeong Ahn, Chungnam National Univ., Daejeon, South Korea

3:20 **Break**

3:35 **Discussion**

3:45 **0345** The past and the present: The rove beetle tribe Othiini now and 99 million years ago. **Janina Kypke** (j.kypke@snm.ku.dk)[1], Shuhei Yamamoto[2], Alexey Y. Solodovnikov[3], Adam Brunke[4] and Dagmara Zyla[1], [1]Natural History Museum, Copenhagen, Denmark, [2]Kyushu Univ., Fukuoka, Japan, [3]Statens Naturhistoriske Museum, Zoologisk Museum, Copenhagen, Denmark, [4]Natural History Museum, Vienna, Austria

4:00 **0346** Towards a classification of the rove beetle subtribe Amblyopinina (Coleoptera: Staphylininae). **Josh Jenkins Shaw** (josh.shaw@snm.ku.dk)[1] and Alexey Y. Solodovnikov[2], [1]Natural History Museum, Copenhagen, Denmark, [2]Statens Naturhistoriske Museum, Zoologisk Museum, Copenhagen, Denmark

4:15 **0347** The Staphylinidae of Alaska: An overview. **Derek Sikes** (dssikes@alaska.edu), Univ. of Alaska, Fairbanks, AK

4:30 **0348** Arctic staphylinids (Coleoptera: Staphylinidae): What do we know about them and what remains to be discovered? **Vladimir Gusarov** (vladimir.gusarov@nhm.uio.no), Natural History Museum, Oslo, Norway

4:45 **0349** Rove beetles as a model for studying the Great American Biotic Interchange, an outline of my Ph.D. project. **Aslak Hansen** (aslakkh@hotmail.com)[1], Mariana Posse[2] and Alexey Solodovnikov[1], [1]Natural History Museum, Copenhagen, Denmark, [2]National Scientific and Technical Research Council, Buenos Aires, Argentina

5:00 **0350** Relicts plus megaclade: The "Omaliine Group"

of Staphylinidae (Coleoptera). **Margaret Thayer** (mthayer@fieldmuseum.org), Field Museum of Natural History, Chicago, IL

5:15 **0351** Data and effort integration in the systematic study of rove beetles: Challenges and priorities. **Alexey Solodovnikov** (asolodovnikov@snm.ku.dk), Natural History Museum, Copenhagen, Denmark

5:30 **Concluding Remarks**

Member Symposium: Psyllids and "Candidatus Liberibacter" Species: Novel Insights about These Destructive Vector-Bacteria Partnerships

Meeting Room 503 (Convention Center)

Moderators and Organizers: Ismael E. Badillo[1] and Gabriela Esparza-Diaz[2], [1]Texas A&M Univ., Weslaco, TX, [2]Amerstem, Inc, Camarillo, CA

1:30 **0352** Psyllids and Liberibacter: A global threat to economically important crops. **Joseph Munyaneza** (joseph.munyaneza@ars.usda.gov), USDA - ARS, Beltsville, MD

1:45 **0353** Changes in vector behavior and host attraction following *Candidas liberibacter* acquisition and host infection. **Monique Rivera** (monique.rivera@ufl.edu), Xavier Martini, Kirsten Pelz-Stelinski and Lukasz Stelinski, Univ. of Florida, Lake Alfred, FL

2:00 **0354** Acquisition, transmission and vector competence in the HLB-bacterium-Asian citrus psyllid pathosystem. **Eldesouky Ammar** (desoukyammar@gmail.com)[1], David Hall[2], Robert Shatters[2] and Michelle Cilia[3], [1]Univ. of Florida, Fort Pierce, FL, [2]USDA - ARS, Fort Pierce, FL, [3]Cornell Univ., Ithaca, NY

2:15 **0355** Understanding probing biology and transmission of '*Candidatus* Liberibacter solanacearum' by potato psyllid using electropenetrography. **Tariq Mustafa** (tariq.mustafa@uaf.edu.pk)[1,2,3], David Horton[1], William Rodney Cooper[1], Richard Zack[2] and Joseph Munyaneza[1], [1]USDA - ARS, Wapato, WA, [2]Washington State Univ., Pullman, WA, [3]Univ. of Agriculture, Faisalabad, Pakistan

2:30 **0356** Bacterial endosymbionts of potato psyllid, *Bactericera cockerelli*. **William Rodney Cooper** (rodney.cooper@ars.usda.gov), USDA - ARS, Wapato, WA

2:45 **0357** Seasonal association of potato psyllid with *Lycium* spp. in the Pacific Northwest. **Jenita Thinakaran** (jenita.thinakaran@ars.usda.gov), USDA - ARS, Wapato, WA

3:00 **Break**

3:15 **0358** Incidence of insecticide resistance and its impact on the potato psyllid-host plant interactions. **Ada Szczepaniec** (ada.szczepaniec@ag.tamu.edu), Texas A&M Univ., Amarillo, TX

3:30 **0359** Novel insights into the psyllid-Lso-plant partnership based on the comparison of Lso haplotypes. **Cecilia Tamborindeguy** (ctamborindeguy@tamu.edu), Texas A&M Univ., College Station, TX

3:45 **0360** Tissue-specific transcriptional responses related to the horizontal and vertical transmission of "*Candidatus* Liberibacter solanacearum" by *Bactericera cockerelli*. **Ismael E. Badillo-Vargas** (ismael.badillo@ag.tamu.edu), Texas A&M Univ., Weslaco, TX

4:00 **0361** Understanding psyllid vector interactions with "*Candidatus* Liberibacter asiaticus": Lessons from systems biology. **Michelle (Cilia) Heck** (mlc68@cornell.edu), Cornell Univ., Ithaca, NY; Boyce Thompson Institute for Plant Research, Ithaca, NY; USDA - ARS, Ithaca, NY

4:30 **Discussion**

Member Symposium: Stored-Product Entomology: Innovative Approaches for Integrated Insect Pest Management

Meeting Room 405 (Convention Center)

Moderators and Organizers: Deanna Scheff[1] and Sam Cook[2], [1]USDA - ARS, Manhattan, KS, [2]Iowa State Univ., Ames, IA

1:30 **Welcoming Remarks**

1:45 **0362** Pest control down to a science. **Michelle Hartzer** (mhartzer@rollins.com), Rollins, Atlanta, GA

2:00 **0363** Recent advances in postharvest pest control from California, the land of fruits and nuts. **Spencer Walse** (spencer.walse@ars.usda.gov), USDA - ARS, Parlier, CA

2:15 **0364** Innovative approaches for management of stored product psocids. **George Opit** (george.opit@okstate.edu), Oklahoma State Univ., Stillwater, OK

2:30 **0365** Packaging treatments for the control of dermestids. **Deanna Scheff** (deanna.scheff@ars.usda.gov)[1], Frank Arthur[1], James Campbell[1] and Scott W. Myers[2], [1]USDA - ARS, Manhattan, KS, [2]USDA - APHIS, Buzzards Bay, MA

2:45 **0366** Hermetic technologies for grain storage on smallholder and organic farms. **Ibrahim Baoua** (baoua.ibrahim@gmail.com)[1] and Dieudonne Baributsa[2], [1]Univ. of Maradi, Niger, [2]Purdue Univ., West Lafayette, IN

3:00 **0367** Nothin' but net…and some other stuff: Pest management innovations for *Tyrophagus putrescentiae*. **Thomas Phillips** (twp1@ksu.edu)[1], Salehe Abbar[1], Barbara Amoah[2], M. Wes Schilling[3], Xue Zhang[3], Yan Zhao[3,4] and Yan Campbell[3], [1]Kansas State Univ., Manhattan, KS, [2]South Carolina State Univ., Orangeburg, SC, [3]Mississippi State Univ., Mississippi State, MS, [4]Johnsonville Sausage, Sheboygan Falls, WI

3:15 **Break**

3:35 **0368** Advances in understanding the impact of food spillage accumulations outside of food facilities on stored product insect populations. **James Campbell** (james.campbell@ars.usda.gov)[1], Tanja McKay[2] and Deanna Scheff[1], [1]USDA - ARS, Manhattan, KS, [2]Arkansas State Univ., Jonesboro, AR

3:50 **0369** Response of three *Trogoderma* population larvae and red flour beetle larvae to two formulations of chlorphenapyr on crevice plates. **Sharon Dobesh** (sdobesh@ksu.edu)[1], Frank Arthur[2] and R. Jeff Whitworth[1], [1]Kansas State Univ., Manhattan, KS, [2]USDA - ARS, Manhattan, KS

4:05 **0370** Presentation withdrawn

4:20 **0371** Ozone as a potential alternative for the management of stored product insects. **Barbara Amoah** (bamoah@scsu.edu), Jewel Wrighton, Katelyn Kern, Valery Fernandez-Davila and Rizana M. Mahroof, South Carolina State Univ., Orangeburg, SC

4:35 **0372** Using mating delay experiments to assess population persistence in the face of mating disruption for pest management. **Alison Gerken** (alison.gerken@ars.usda.gov) and James Campbell, USDA - ARS, Manhattan, KS

4:50 **0373** Prediction of *Sitophilus zeamais* mortality as a function of O_2 consumption under hermetic storage. **Sam Cook** (cooks@iastate.edu)[1], Chukiat Chotikasatian[2], Madjaliwa Nzamwita[3], Francis Aboagye-Nuamah[4], Carl Bern[1] and Dirk Maier[1], [1]Iowa State Univ., Ames, IA, [2]Kasetsart Univ., Nakhon Pathom, Thailand, [3]Rwanda Agriculture and Animal Resources Development Board, Huye, Rwanda, [4]Methodist Univ. College, Wenchi, Ghana

5:05 **Concluding Remarks**

Member Symposium: What's the Buzz with Industrial Hemp and Entomology?

Meeting Room 710 (Convention Center)

Moderators and Organizers: Amanda Skidmore and Nathan Mercer, Univ. of Kentucky, Lexington, KY

1:30 **Introductory Remarks**

1:45 **0374** Hemp insect pest management needs and challenges. **Whitney Cranshaw** (whitney.cranshaw@colostate.edu), Colorado State Univ., Fort Collins, CO

2:15 **0375** Colorado Department of Agriculture: Industrial hemp. **Maureen West** (maureen.west@state.co.us), Colorado Dept. of Agriculture, Broomfield, CO

2:30 **0376** Beginning pest management research on hemp in Virginia. **Kadie Britt** (kadieb@vt.edu)[1] and Thomas P. Kuhar[2], [1]Univ. of Tennessee, Knoxville, TN, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

2:45 **0377** Hemp is back in Tennessee: The path to its revival. **Jerome F. Grant** (jgrant@utk.edu) and Cody Seals, Univ. of Tennessee, Knoxville, TN

3:00 **0378** Ignite, inspire, innovate and educate the public to enhance hemp acceptance and production: It's hemp-ly a-maze-ing! **Cody Seals** (wseals@utk.edu)[1], Jerome F. Grant[1] and Clint Palmer[2], [1]Univ. of Tennessee, Knoxville, TN, [2]Middle Tennessee State Univ., Murfreesboro, TN

3:15 **0379** Cannabaceae insect pest management. **Lily Calderwood** (lbc75@cornell.edu)[1] and Heather Darby[2], [1]Cornell Univ., Ithaca, NY, [2]Univ. of Vermont, Burlington, VT

3:30 **Break**

3:45 **0380** Development of industrial hemp as a viable cropping option for the Canadian Prairies. **Jan Slaski** (jan.slaski@innotechalberta.ca), InnoTech Alberta, Vegreville, AB, Canada

4:00 **0381** What's the buzz about hemp? **David Williams** (dwilliam@uky.edu), Univ. of Kentucky, Jackson, KY

4:15 **0382** Cannabinoid polymorphism in Minnesota feral *Cannabis* supports a simple genetic model for the inheritance of phenotype. **George Weiblen** (gweiblen@umn.edu), Clemon Dabney and Johnathan Wenger, Univ. of Minnesota, St. Paul, MN

4:30 **0383** Influence of variety and management on chemically mediated hemp-pest interactions. **John J. Couture** (couture@purdue.edu)[1], Marguerite Bolt[2], Gordon McNickle[1] and Janna Beckerman[1], [1]Purdue Univ., West Lafayette, IN, [2]Michigan State Univ., East Lansing, MI

4:45 **0384** Influence of genetics and management on hemp-arthropod interactions. **Marguerite Bolt** (margyabolt@gmail.com)[1], Janna Beckerman[2] and John J. Couture[2], [1]Michigan State Univ., East Lansing, MI, [2]Purdue Univ., West Lafayette, IN

5:00 **0385** State of the Union: Entomology and industrial hemp from across the United States. **Amanda Skidmore** (amanda.skidmore@gmail.com) and Nathan Mercer, Univ. of Kentucky, Lexington, KY

5:15 **Discussion**

Organized Meeting: Americas Neuropterists Meeting

Meeting Room 504 (Convention Center)

Moderators and Organizers: Roberto López-Garcia[1], Atilano Contreras-Ramos[1] and David E. Bowles[2], [1]Univ. Nacional Autónoma de México, Mexico City, Mexico, [2]U.S. National Park Service, Republic, MO

1:30 **Welcoming Remarks**

1:35 **0386** Recent collaborative studies in the systematics of New World Chrysopidae. **Catherine A. Tauber** (cat6@cornell.edu)[1], Francisco Sosa[2], Gilberto Albuquerque[3], Atilano Contreras-Ramos[4], Shelby Kilpatrick[5] and John Oswald[5], [1]Cornell Univ., Davis, CA, [2]Univ. Centroccidental Lisandro Alvarado, Barquisimeto, Venezuela, [3]Univ. Estadual do Norte Fluminense, Campos dos Goytacazes, Brazil, [4]Univ. Nacional Autónoma de México, Mexico City, Mexico, [5]Texas A&M Univ., College Station, TX

1:50 **0387** Coniopterygidae and Hemerobiidae (Neuroptera) of Nanacamilpa, Tlaxcala, Mexico. **Yesenia Marquez-López** (yeseniamarquez23@gmail.com)[1] and Atilano Contreras-Ramos[2], [1]Univ. Autónoma Metropolitana-Iztapalapa, Mexico, Mexico, [2]Univ. Nacional Autónoma de México, Mexico City, Mexico

2:05 **0388** Advancement in the taxonomy of the genus *Myrmeleon* of the Neotropics. **Roberto López-Garcia** (rologar87@gmail.com), Univ. Nacional Autónoma de México, Mexico City, Mexico

2:20 **0389** Current knowledge of antlion larvae in Mexico. **Fernando Acevedo** (facevedoramos@gmail.com), Univ. Nacional Autónoma de México, Mexico City, Mexico

2:35 **Break**

2:50 **0390** A new phylogeny and classification of the Myrmeleontidae (Insecta: Neuroptera) based on anchored hybrid enrichment data. Renato Machado[1], **John Oswald** (j-oswald@tamu.edu)[1], Shaun Winterton[2], Alan Lemmon[3] and Emily Lemmon[3], [1]Texas A&M Univ., College Station, TX, [2]California Dept. of Food and Agriculture, Sacramento, CA, [3]Florida State Univ., Tallahassee, FL

3:05 **0391** Towards studying the diversity of Neuroptera in an altitudinal gradient, Volcán Tacaná, Chiapas, Mexico. **Rodolfo Cancino-López** (cancinorodolfoj@gmail.com), Univ. Nacional Autónoma de México, Mexico City, Mexico

3:20 **0392** The Neuroptera of Missouri: 70 years after Froeschner. **David E. Bowles** (david_bowles@nps.gov)[1], Michael Ferro[2] and Robert W. Sites[3], [1]U.S. National Park Service, Republic, MO, [2]Clemson Univ., Clemson, SC, [3]Univ. of Missouri, Columbia, MO

3:35 **0393** Concluding remarks and towards ISN 2018 in Germany. **Atilano Contreras-Ramos** (acontreras@ib.unam.mx)[1], David E. Bowles[2] and John Oswald[3], [1]Univ. Nacional Autónoma de México, Mexico City, Mexico, [2]U.S. National Park Service, Republic, MO, [3]Texas A&M Univ., College Station, TX

Organized Meeting: Current Advances in Acarology

Meeting Room 711 (Convention Center)

Moderators and Organizers: Daniel Carrillo[1], Monica A. Farfan[2] and Jose Carlos Rodrigues[3], [1]Univ. of Florida, Homestead, FL, [2]Univ. of Illinois, Chicago, IL, [3]Univ. of Puerto Rico, San Juan, PR

1:30 **0394** Hyperparasitic lousy mites, *Myialges trinotoni* (Acariformes: Epidermoptidae), associated with water fowl in Manitoba, Canada. **Wayne Knee** (whknee@gmail.com), Agriculture and Agri-Food Canada, Ottawa, ON, Canada

1:45 **0395** Augmentation of basal resources in a soil food web changes patterns of intraguild predation and decomposition rate. **Monica Farfan** (farfan.2@osu.edu) and David Wise, Univ. of Illinois, Chicago, IL

2:00 **0396** The use of *Amblyseius swirskii* for biological control in pepper and squash cropping systems. **Lorena Lopez** (lorelopezq.257@ufl.edu)[1], Oscar Liburd[2] and Hugh A. Smith[1], [1]Univ. of Florida, Wimauma, FL, [2]Univ. of Florida, Gainesville, FL

2:15 **0397** The Monatractides (Parasitengona: Torrenticolidae) of North America: A water mite story. **Whitney Nelson** (wanelson@uark.edu), Ray Fisher, Danielle Fisher and Ashley P. G. Dowling, Univ. of Arkansas, Fayetteville, AR

2:30 **0398** Who lives inside *Haemaphysalis lemuris*? An exploration of its microbiome. **Paula Lado** (ladohenaise.1@osu.edu) and Hans Klompen, The Ohio State Univ., Columbus, OH

2:45 **0399** Edaphic Mesostigmata mites in rose cultivation and associated vegetation areas in the Bogota plateau (Cundinamarca, Colombia). **Diana Rueda-Ramírez** (dianaru@gmail.com)[1], Amanda Varela[2] and Gilberto de Moraes[1], [1]Univ. de São Paulo, Piracicaba, Brazil, [2]Pontificia Univ. Javeriana, Bogotá, Colombia

3:00 **0400** Phylogenetic inference of North American water mites in the subgenus *Micruracarus* (Genus *Arrenurus*, Family Arrenuridae) utilizing morphological and molecular characters. **Rachel Shoop** (r.k.shoop@gmail.com), Bruce Smith, Shahan Derkarabetian, Marshal Hedin and Andrew J. Bohonak, San Diego State Univ., San Diego, CA

3:15 **0401** Presentation withdrawn

SD0402 In preparation for a potential incursion of citrus leprosis: Host plant range and distribution of *Brevipalpus* mites in south Florida citrus groves. **Marielle Berto** (marielle.berto@gmail.com)[1,2], Amy L. Roda[3] and Daniel Carrillo[2], [1]Univ. de São Paulo, Piracicaba, Brazil, [2]Univ. of Florida, Homestead, FL, [3]USDA - APHIS, Miami, FL

3:30 **Break**

3:45 **0403** Cannibalistic behavior differs between genders in *Phytoseiulus persimilis* (Acari: Phytoseiidae). **Alexandra Revynthi** (a.m.revynthi@uva.nl), Kaya van Pol, Arne Janssen and Martijn Egas, Univ. of Amsterdam, Amsterdam, Netherlands

4:00 **0404** Revealing mite-scarabs networks implementing R- bipartite package. **Edwin Quintero-Gutierrez** (ejquinterog@uqvirtual.edu.co)[1] and Orlando Combita-Heredia[2], [1]Univ. de Caldas, Manizales, Colombia, [2]The Ohio State Univ., Columbus, OH

4:15 **0405** Ontogeny, ecology and systematic relationships of the extremely large size mites Megalolaelapidae (Mesostigmata: Eviphidoidea). **Orlando Combita-Heredia** (combitaheredia.1@buckeyemail.osu.edu)[1], Edwin Quintero[2] and Hans Klompen[1], [1]The Ohio State Univ., Columbus, OH, [2]Univ. de Caldas, Manizales, Colombia

4:30 **0406** Presentation withdrawn

4:45 **0407** Comprehensive phylogeny of acariform mites provides insights on the origin of the four-legged mites (Eriophyoidea), a long branch with massive basal extinctions. **Pavel B. Klimov** (pklimov@umich.edu)[1], Samuel Bolton[2], Barry O'Connor[1], Philipp Chetverikov[3], Almir Pepato[4], Abdolazim Mortazavi[1], Andrei Tolstikov[5], Gary R. Bauchan[6] and Ronald Ochoa[6], [1]Univ. of Michigan, Ann Arbor, MI, [2]The Ohio State Univ., Columbus, OH, [3]Saint-Petersburg State Univ., St. Petersburg, Russia, [4]Univ. Federal de Minas Gerais, Belo Horizonte, Brazil, [5]Tyumen State Univ., Tyumen, Russia, [6]USDA - ARS, Beltsville, MD

5:00 **SP0408** A *Varroa destructor* protein atlas reveals molecular underpinnings of developmental transitions and sexual differentiation. **Alison McAfee** (alison.mcafee@alumni.ubc.ca)[1], Queenie Chan[1], Jay Evans[2] and Leonard Foster[1], [1]Univ. of British Columbia, Vancouver, BC, Canada, [2]USDA - ARS, Beltsville, MD

5:10 **SP0409** Physical and chemical control methods as methyl bromide alternatives to control *Tyrophagus putrescentiae* Schrank (Sarcoptiformes: Acaridae) in country ham facilities. **Salehe Abbar** (abbar@k-state.edu)[1], Yan Zhao[2], Yan Campbell[3], Xue Zhang[3], M. Wes Schilling[3] and Thomas Phillips[1], [1]Kansas State Univ., Manhattan, KS, [2]Johnsonville Sausage, Sheboygan Falls, WI, [3]Mississippi State Univ., Mississippi State, MS

5:20 **SP0410** First assessment of marine mites (Halacaridae: Acariformes) phylogeny employing molecular data and a report on its sperm cell diversity. **Almir Pepato** (apepato@gmail.com)[1] and Pavel B. Klimov[2], [1]Univ. Federal de Minas Gerais, Belo Horizonte, Brazil, [2]Univ. of Michigan, Ann Arbor, MI

Organized Meeting: International Society of Hymenopterists Business Meeting

Meeting Room 605 (Convention Center)

Moderators and Organizers: Andrew Polaszek and Natalie Dale-Skey, Natural History Museum, London, United Kingdom

1:30 PM - 5:30 PM

Organized Meeting: SOLA Scarab Workers

Meeting Room 607 (Convention Center)

Moderator and Organizer: Andrew B. T. Smith, Canadian Museum of Nature, Ottawa, ON, Canada

1:30 **Introductory Remarks**

1:35 **0411** The natural history and evolution of SOLA based on 20 years of observational data. **Andrew B. T. Smith** (asmith@unl.edu), Canadian Museum of Nature, Ottawa, ON, Canada

1:55 **0412** Scarab research in Colorado (Coleoptera: Scarabaeoidea). **Frank T. Krell** (frank.krell@dmns.org), Denver Museum of Nature and Science, Denver, CO

2:15 **0413** The dynastine scarabs of the USA and Canada. **Brett Ratcliffe** (bratcliffe1@unl.edu)[1] and Ronald Cave[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Florida, Fort Pierce, FL

2:35 **0414** Dung beetles down under: Insights into scarabaeine evolution from a depauperate but unique fauna. **Nicole Gunter** (ngunter@cmnh.org), Cleveland Museum of Natural History, Cleveland, OH

2:55 **Break**

3:15 **0415** A review of the tribal classification of the Melolonthinae, with emphasis on the New World fauna. **Arthur Evans** (arthurevans@verizon.net), Richmond, VA

3:35 **0416** North American *Serica*: Resolved or not? **Reese J. Worthington** (rworthin@go.olemiss.edu) and Paul K. Lago, Univ. of Mississippi, University, MS

3:55 **0417** Two newly acquired Scarabaeidae collections, and their impacts on the collections of the Natural History Museum. **Maxwell Barclay** (m.barclay@nhm.ac.uk), The Natural History Museum, London, United Kingdom

4:15 **0418** Miscellaneous new and improved methods for collecting scarabs. **William B. Warner** (wbwarner1@cox.net), Scarabs Newsletter, Chandler, AZ

4:35 **0419** What have been and what can be delimited as species using molecular data under the multi-species coalescent model? A case study using the Hercules beetles. **Jen-Pan Huang** (jhuang@fieldmuseum.org), Field Museum of Natural History, Chicago, IL

4:55 **Discussion**

10-min: P-IE, Invasive Species 1

Meeting Room 507 (Convention Center)

Moderators: Benjamin Jaffe[1] and Joseph Culin[2], [1]Univ. of Wisconsin, Madison, WI, [2]Clemson Univ., Clemson, SC

1:30 **0420** Association mapping of virulence in soybean aphid (*Aphis glycines*). **Aline S. Guidolin** (sartoriguidolin.1@osu.edu)[1], Vitor Pavinato[1], Doris Lagos-Kutz[2], Glen L. Hartman[3] and Andrew Michel[1], [1]The Ohio State Univ., Wooster, OH, [2]USDA - ARS, Urbana, IL, [3]National Soybean Research Center, Urbana, IL

1:40 **0421** Assessment of swarmed Unmanned Aircraft Systems (UAS) in the release of sterile Mexican fruit fly (*Anastrepha ludens*). **Nathan Moses-Gonzales** (nmosesgo@m3cg.us), M3 Consulting Group, Dayton, OH

1:50 **0422** Tracking *Drosophila suzukii* dispersion using a combination of immunomarking and genetics. **Gabriella Tait** (gabriella.tait@fmach.it)[1,2,3], Ferdinand Pfab[4], Alberto Grassi[2], Lino Ometto[5], Silvia Vezzulli[2], Valerio Rossi Stacconi[2], Andrea Piazza[6], Angela Gottardello[2], Andrea Pugliese[4], Giuseppe Firrao[3], Vaughn Walton[1] and Gianfranco Anfora[2], [1]Oregon State Univ., Corvallis, OR, [2]Edmund Mach Foundation, San Michele all'Adige, Italy, [3]Udine Univ., Udine, Italy, [4]Trento Univ., Trento, Italy, [5]Independent Scientist, San Michele all'Adige, Italy, [6]Meteo Trentino, Trento, Italy

2:00 **0423** Multistate comparison of attractants, and the impact of background volatiles on trapping *Drosophila suzukii* (Diptera: Drosophilidae) in raspberry and blueberry. **Benjamin Jaffe** (bjaffe2@wisc.edu)[1], Harit K. Bal[2], Joshua Grant[3], Matt Grieshop[4], Jana Lee[5], Oscar Liburd[6], Eric McDougal[5], Cesar Rodriguez[7], Elena Rhodes[6], Ashfaq Sial[3], Aijun Zhang[8] and Christelle Guédot[1], [1]Univ. of Wisconsin, Madison, WI, [2]Association of Indian Entomologists in North America, East Lansing, MI, [3]Univ. of Georgia, Athens, GA, [4]Michigan State Univ., East Lansing, MI, [5]USDA - ARS, Corvallis, OR, [6]Univ. of Florida, Gainesville, FL, [7]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ, [8]USDA - ARS, Beltsville, MD

2:10 **0424** What limits the distribution of *Liriomyza huidobrensis* and its congener *L. sativae* in their native niche: When temperature and competition affect species' distribution range in Guatemala. **Genoveva Rodriguez-Castaneda** (genioveva@gmail.com)[1], Charles MacVean[2], Anouschka Hof[3] and Catherine Cardona[1], [1]Univ. del Valle, Guatemala, Guatemala, [2]Saint Francis Univ., Loretto, PA, [3]Univ. of Wisconsin, Madison, WI

2:20 **0425** Allium leafminer, *Phytomyza gymnostoma*, a new invasive pest of onions, garlic, chives and other *Alliums*. **Dana Roberts** (dcr5101@psu.edu)[1], Shelby J. Fleischer[1], Thomas C. Baker[1], Julie Urban[1], Sven-Erik Spichiger[2], Lawrence Barringer[2] and Timothy Elkner[3], [1]Pennsylvania State Univ., University Park, PA, [2]Pennsylvania Dept. of Agriculture, Harrisburg, PA, [3]Pennsylvania State Univ., Manheim, PA

2:30 **Break**

2:40 **0426** Evaluation of mating disruption for managing *Tuta absoluta* in greenhouse tomato crops in Kuwait. **Mustapha Jallow** (mjallow@kisr.edu.kw), Mohammed Albaho and Abdelhafiz Dahab, Kuwait Institute for Scientific Research, Kuwait City, Kuwait

2:50 **0427** Heat kill of apple maggot fly (Diptera: Tephritidae) pupae and implications for organic yard waste movement. **Wee Yee** (wee.yee@ars.usda.gov) and Peter Chapman, USDA - ARS, Wapato, WA

3:00 **0428** Spotted lanternfly: The Penn State Extension 2017 outreach program. **Amy Korman** (amk6396@psu.edu)[1], Emelie Swackhamer[2] and Karen Bernhard[3], [1]Pennsylvania State Univ., Nazareth, PA, [2]Pennsylvania State Univ., Collegeville, PA, [3]Pennsylvania State Univ., Allentown, PA

3:10 **0429** Garlics and onions and leeks, oh no! Monitoring and management of the invasive leek moth, *Acrolepiopsis assectella*. **Victor Izzo** (izzovi@gmail.com)[1] and Scott Lewins[2], [1]Univ. of Vermont, Burlington, VT, [2]St. Michael's College, Colchester, VT

3:20 **0430** Reconstructing the invasion dynamics of the European grapevine moth (*Lobesia botrana*) in California: Insights from a successful eradication. **Tyler E. Schartel** (tylersch@ucr.edu)[1], Gregory S. Simmons[2], Lucia Varela[3], Monica Cooper[4] and Matt Daugherty[1], [1]Univ. of California, Riverside, CA, [2]USDA - APHIS, Salinas, CA, [3]Univ. of California Cooperative Extension, Santa Rosa, CA, [4]Univ. of California, Napa, CA

3:30 **0431** Our six decade dance with the hemlock woolly adelgid. **Joseph Culin** (jculin@clemson.edu), Clemson Univ., Clemson, SC

10-min: P-IE, IPM, Horticultural and Specialty Crops 1

Meeting Room 506 (Convention Center)

Moderators: Craig Roubos[1], Arthur Agnello[2] and Katharine Swoboda Bhattarai[3], [1]Univ. of Georgia, Athens, GA, [2]Cornell Univ., Geneva, NY, [3]North Carolina State Univ., Raleigh, NC

1:30 **0432** SPLAT SWD: A semiochemical attract and kill formulation for spotted-wing drosophila, *Drosophila suzukii*. **Rodrigo Silva** (rodrigo.silva@iscatech.com)[1], Michael Seagraves[2], Jimmy Klick[3], Cesar Rodriguez-Saona[4], Robert Holdcraft[5], William Urrutia[1], Carmem Bernardi[1], Agenor Mafra-Neto[1] and Jesse Saroli[1], [1]ISCA Technologies, Inc, Riverside, CA, [2]Driscoll's Strawberry Associates, Inc, Watsonville, CA, [3]Oregon State Univ., Corvallis, OR, [4]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [5]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ

1:40 **0433** Evaluation of organic insecticides for management of spotted wing drosophila, *Drosophila suzukii*, in Georgia blueberries. **Craig Roubos** (craig.roubos@uga.edu), Brian Little and Ashfaq Sial, Univ. of Georgia, Athens, GA

1:50 **0434** Mass trapping and border sprays as alternative strategies to manage *Drosophila suzukii* in blueberries. **Janine Spies** (jrazze@ufl.edu) and Oscar Liburd, Univ. of Florida, Gainesville, FL

2:00 **0435** Spotted wing drosophila monitoring and distribution on organic strawberries in Florida. **Elena Rhodes** (erhodes@ufl.edu), Carlene Chase, Xin Zhao and Oscar Liburd, Univ. of Florida, Gainesville, FL

2:10 **0436** Gelsura® Fruit Fly Bait —An innovative fruit fly management tool. Claude Taranta[1], Teresia Nyoike[2], **Siddharth Tiwari** (siddharth.tiwari@basf.com)[2] and Richard Tyler[2], [1]BASF SE, Limburgerhof, Germany, [2]BASF Corporation, Research Triangle Park, NC

2:20 **0437** Oviposition host preferences and pupation behavior of *Drosophila suzukii* in California cherries. **Brian Gress** (begress@ucdavis.edu) and Frank Zalom, Univ. of California, Davis, CA

2:30 **0438** Susceptibility of cold hardy grapes to *Drosophila suzukii* (Diptera: Drosophilidae). Emma Pelton[1], **Christelle Guédot** (guedot@wisc.edu)[2] and Claudio Gratton[2], [1]The Xerces Society for Invertebrate Conservation, Portland, OR, [2]Univ. of Wisconsin, Madison, WI

2:40 **0439** Diversity and integrated management of fruit flies on fruit crops in the Indian Punjab. **Sandeep Mahandiratta** (sandeep_pau.1974@pau.edu), Punjab Agricultural Univ., Ludhiana, India

2:50 **0440** Management of Asian citrus psyllid (*Diaphorina citri*) vector of Huanglongbing pathogens: Organic and conventional programs. **Jawwad Qureshi** (jawwadq@ufl.edu)[1] and Philip A. Stansly[2], [1]Univ. of Florida, Fort Pierce, FL, [2]Univ. of Florida, Immokalee, FL

3:00 **0441** Inscalis™ insecticide: A management tool for Asian citrus psyllid (*Diaphorina citri*) in citrus. **Teresia Nyoike** (teresia.nyoike@basf.com), Tommy Wofford, Joe Stout, Steve Broscious, Catherine Holmes, John Descary and Daniel O'Byrne, BASF Corporation, Research Triangle Park, NC

3:10 **Break**

3:20 **0442** Toxicity of selected insecticides to *Diaphorina citri*. **Nastaran Tofangsazi** (ntsazi@ucr.edu), Elizabeth Grafton-Cardwell and Matt Daugherty, Univ. of California, Riverside, CA

3:30 **0443** Factors influencing control of navel orangeworm (*Amyelois transitella*) in almond and pistachios. **Joel Siegel** (joel.siegel@ars.usda.gov), USDA - ARS, Parlier, CA

3:40 **0444** Assessing damage potential of leaffooted bug (*Leptoglossus* spp.) in almond. **Apurba Barman** (abarman2@ucmerced.edu) and Andrea Joyce, Univ. of California, Merced, CA

3:50 **0445** Assessment of management tactics against Pacific flatheaded borer in hazelnuts. **Heather Andrews** (heather.andrews@oregonstate.edu), Aaron Heinrich, Anthony Mugica and Nik G. Wiman, Oregon State Univ., Aurora, OR

4:00 **Break**

4:10 **0446** Refining plum curculio degree day model in New Jersey. **Clement Akotsen-Mensah** (ca555@scarletmail.Rutgers.edu) and Anne Nielsen, Rutgers, The State Univ. of New Jersey, Bridgeton, NJ

4:20 **0447** Can codling moth, *Cydia pomonella* (L.), be mass trapped in English walnut? **Elizabeth Boyd** (eaboyd@csuchico.edu)[1] and Justin Nay[2], [1]California State Univ., Chico, CA, [2]Integral Ag. Inc, Durham, CA

4:30 **0448** Effects of verbenone repellent on *Xylosandrus germanus* ambrosia beetle infestations in apple trees. **Arthur Agnello** (ama4@cornell.edu)[1], Dave Combs[1] and Amy Sparer[2], [1]Cornell Univ., Geneva, NY, [2]Dickinson College, Carlisle, PA

4:40 **0449** Management of flatheaded appletree borer in nursery production with cover crops. **Karla Addesso** (kaddesso@tnstate.edu)[1], Sujan Dawadi[2], Jason B. Oliver[1] and Paul O'Neal[1], [1]Tennessee State Univ., McMinnville, TN, [2]Tennessee State Univ., Nashville, TN

4:50 **0450** Refining IPM programs for the management of San Jose scale and wooly apple aphid in apple orchards. **David Biddinger** (djb134@psu.edu)[1] and Neelendra Joshi[2], [1]Pennsylvania State Univ., Biglerville, PA, [2]Univ. of Arkansas, Fayetteville, AR

5:00 **0451** Multi-state evaluation of polyculture trap crop for managing brown marmorated and native stink bugs in organic peppers. **Clarissa Mathews** (cmathews@shepherd.edu)[1,2], Brett Blaauw[3], Galen Dively[4], James Kotcon[5], Jennifer Moore[6], Emily Ogburn[7], Douglas G. Pfeiffer[8], Taliaferro Trope[8], James F. Walgenbach[7], Celeste Welty[9], Gladis Zinati[10] and Anne Nielsen[11], [1]Redbud Farm, LLC, Inwood, WV, [2]Shepherd Univ., Shepherdstown, WV, [3]Michigan State Univ., East Lansing, MI, [4]Univ. of Maryland, College Park, MD, [5]West Virginia Univ., Morgantown, WV, [6]Univ. of Tennessee, Knoxville, TN, [7]North Carolina State Univ., Mills River, NC, [8]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [9]The Ohio State Univ., Columbus, OH, [10]Rodale Institute, Kutztown, PA, [11]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ

5:10 **0452** Presentation withdrawn

5:20 **0453** Sugar formulations can be utilized to control spotted wing drosophila. **Man-Yeon Choi** (mychoi@ars.usda.gov)[1], Siew Bee Tang[2] and Jana Lee[1], [1]USDA - ARS, Corvallis, OR, [2]Oregon State Univ., Corvallis, OR

10-min: P-IE, Pollination

Meeting Room 505 (Convention Center)

Moderators: Rachel Mallinger[1] and Matthew Smart[2], [1]USDA - ARS, Fargo, ND, [2]U.S. Geological Survey, Lincoln, NE

1:30 **0454** Navigating trade-offs between pest management and pollinator conservation in cucurbits. **Thomas Wood** (woodtho4@msu.edu) and Zsofia Szendrei, Michigan State Univ., East Lansing, MI

1:40 **0455** How do pollination services to sunflowers vary across plant genotypes, environments, and pollinator taxa? **Rachel Mallinger** (rachel.mallinger@ars.usda.gov)[1], Jarrad Prasifka[1], Jeffrey Bradshaw[2] and Adam Varenhorst[3], [1]USDA - ARS, Fargo, ND, [2]Univ. of Nebraska, Scottsbluff, NE, [3]South Dakota State Univ., Brookings, SD

1:50 **0456** Increasing sustainability of *Megachile rotundata* populations on alfalfa seed farms using floral resource management strategies. **Casey Delphia** (casey.delphia@montana.edu), Kevin M. O'Neill and Laura A. Burkle, Montana State Univ., Bozeman, MT

2:00 **0457** Impact on bee pollinators from utility-scale solar development in the southwestern deserts: Species abundance, diversity, community composition. **Leslie Saul-Gershenz** (lsaulgershenz@ucdavis.edu)[1], Lynn Kimsey[1], Neal M. Williams[1], John S. Ascher[2], Thomas Zavortink[1], Robbin W. Thorp[1], Terry Griswold[3], Doug Yanega[4], Jennifer Van Wyk[1] and Caroline Larsen[1], [1]Univ. of California, Davis, CA, [2]National Univ. of Singapore, Singapore, [3]USDA - ARS, Logan, UT, [4]Univ. of California, Riverside, CA

2:10 **0458** Beyond sugar: Allocation and metabolism of nectar amino acids and fatty acids in a Lepidopteran. **Goggy Davidowitz** (goggy@email.arizona.edu)[1], Eran Levin[1] and Marshall McCue[2], [1]Univ. of Arizona, Tucson, AZ, [2]Saint Mary's Univ., San Antonio, TX

2:20 **0459** Current and historical trends for pollinator research in working landscapes. **Jason Harmon** (jason.harmon@ndsu.edu), Katherine Kral, Cayla Bendel, Ryan Limb and Torre Hovick, North Dakota State Univ., Fargo, ND

2:30 **0460** No second chances for pollen-laden queens? **Amber D. Tripodi** (amber.tripodi@ars.usda.gov) and James P. Strange, USDA - ARS, Logan, UT

2:40 **0461** Mass rearing *Osmia lignaria* for commercial pollination. **Gordon Wardell** (gordon.wardell@wonderful.com), Wonderful Orchards, Paso Robles, CA

2:50 **0462** Differential responses of bumble bees and honey bees to visual and olfactory cues. **Johanne Brunet** (johanne.brunet@ars.usda.gov)[1] and Rosabeth Link[2], [1]USDA - ARS, Madison, WI, [2]Univ. of Wisconsin, Madison, WI

3:00 **Break**

3:10 **0463** Quantifying the ecosystem services provided by grasslands in the northern Great Plains to the commercial beekeeping industry. **Matthew Smart** (msmart@usgs.gov)[1] and Clint Otto[2], [1]U.S. Geological Survey, Lincoln, NE, [2]U.S. Geological Survey, Jamestown, ND

3:20 **0464** Effect of tree rows on bee abundance in adjacent hay meadows. **Wayne Ohnesorg** (wohnesorg2@unl.edu), Univ. of Nebraska, Norfolk, NE

3:30 **0465** Whoops, I stepped in it: A novel mechanism of honey bee (*Apis mellifera*) pollination of blueberries. **George D. Hoffman** (george.hoffman@oregonstate.edu), Claire Lande and Sujaya Rao, Oregon State Univ., Corvallis, OR

3:40 **0466** Pesticide risk to honey bees during pollination of a mass blooming crop. **Scott McArt** (shm33@cornell.edu)[1], Ashley Fersch[1], Nelson Milano[1], Lauren Truitt[1] and Katalin Böröczky[1,2], [1]Cornell Univ., Ithaca, NY, [2]Pennsylvania State Univ., University Park, PA

3:50 **0467** Nasonov-based dispensers for pollinator attraction in blueberry, apple and cherry. **Julie Williamson** (adamsju6@gmail.com), Christopher G. Adams, Larry Gut and Rufus Isaacs, Michigan State Univ., East Lansing, MI

4:00 **0468** Cross-continental look at pollinator communities and their services in orchards. **Mia Park** (mia.park@und.edu)[1], Louis Sutter[2], Michael Garratt[3], Gesine Pufal[4], Arjen Groot[5], Deepa Senapathi[3], Robert Paxton[6], Jordi Bosch[7], Romina Rader[8], Alexandra-Maria Klein[9], Simon G. Potts[3], Eleanor Blitzer[10], Virginie Boreux[4], Allistair Campbell[11,12], Kyle Martins[13], Marcos Miñarro[14], Bryan N. Danforth[15], Quint Rusman[5], Georg Andersson[16] and Matthias Albrecht[2], [1]Univ. of North Dakota, Grand Forks, ND, [2]Agroscope, Zürich, Switzerland, [3]Univ. of Reading, Reading, United Kingdom, [4]Univ. of Freiburg, Freiburg, Germany, [5]Wageningen Univ., Wageningen, Netherlands, [6]Martin-Luther-Univ., Halle, Germany, [7]Univ. Autònoma de Barcelona, Cerdanyola del Vallès, Spain, [8]Univ. of New England, Armidale, Australia, [9]Leuphana Univ., Lóneburg, Germany, [10]Carroll College, Helena, MT, [11]Embrapa Amazônia Oriental, Belém, Brazil, [12]Lancaster Univ., Lancaster, United Kingdom, [13]McGill Univ., Montreal, QC, Canada, [14]The Regional Agrifood Research and Development Service, Villaviciosa, Spain, [15]Cornell Univ., Ithaca, NY, [16]National Univ. of Río Negro, Viedma, Argentina

4:10 **0469** Do managed bees have negative effects on wild bees? **Hannah Gaines-Day** (hgaines@wisc.edu), Rachel Mallinger and Claudio Gratton, Univ. of Wisconsin, Madison, WI

4:20 **0470** Regulation of mRNAs and microRNAs found post-mating in honey bee (*Apis mellifera*) queen spermatheca. **Juliana Rangel** (jrangel@tamu.edu) and Nancy Ing, Texas A&M Univ., College Station, TX

10-min: P-IE, Apiculture

Meeting Room 505 (Convention Center)

Moderators: Mohamed Alburaki[1] and Tavvs Alves[2], [1]Univ. of Tennessee, Jackson, TN, [2]Texas A&M Univ., College Station, TX

4:30 **0471** Tracking the honey bee queen (*Apis mellifera*) using Radio-Frequency Identification (RFID). **Charles Stuhl** (charles.stuhl@ars.usda.gov), USDA - ARS, Gainesville, FL

4:40 **0472** *Varroa destructor* dispersal risk tolerance is mediated by its reproductive value. **Keith Delaplane** (ksd@uga.edu), Univ. of Georgia, Athens, GA

4:50 **0473** Measures of honey bee health (*Apis mellifera*) during blueberry and cranberry pollination in New Jersey. **Dean Polk** (polk@aesop.rutgers.edu)[1] and Tim Schuler[2], [1]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ, [2]New Jersey Dept. of Agriculture, Trenton, NJ

5:00 **0474** Using the InVEST Habitat Quality Model to understand spatial and temporal threats to registered apiaries in North Dakota. **Daniel Dixon** (d.dixon@und.edu)[1], Haochi Zheng[1] and Clint Otto[2], [1]Univ. of North Dakota, Grand Forks, ND, [2]U.S. Geological Survey, Jamestown, ND

5:10 **0475** Neonicotinoid residual assessment in Arizona honeybee. **Gadelhak Ahmed** (gadelhakg@email.arizona.edu), Kyle Harrington and Ayman Mostafa, Univ. of Arizona, Phoenix, AZ

5:20 **0476** Landscapes, forage sustainability and pesticides: All affect honeybee health and survival. **Mohamed Alburaki** (malburak@utk.edu)[1], William Meikle[2], John Adamczyk[3] and Scott Stewart[1], [1]Univ. of Tennessee, Jackson, TN, [2]USDA - ARS, Tucson, AZ, [3]USDA - ARS, Poplarville, MS

Sunday, November 5, 2017 • EVENING

Opening Plenary Session with Feature Speaker Mary Roach

Four Seasons Ballroom (Convention Center)

Moderators and Organizers: Susan J. Weller[1] and C. David Gammel[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Entomological Society of America, Annapolis, MD

5:30 **Introduction of Executive Committee**

5:38 **Introductory Remarks**

5:45 **0477** Presidential Address. **Susan J. Weller** (susan.weller@unl.edu), Univ. of Nebraska, Lincoln, NE

6:00 **0478** ICE2020 Helsinki. **Heikki Hokkanen** (heikki.hokkanen@helsinki.fi), Univ. of Helsinki, Helsinki, Finland

6:10 **0479** ESA Executive Director Remarks. **C. David Gammel** (dgammel@entsoc.org), Entomological Society of America, Annapolis, MD

6:20 **0480** Entomological Foundation Update. **May Berenbaum** (maybe@illinois.edu), Univ. of Illinois, Champaign, IL

6:25 **ESA Honorary Members and ESA Fellows**

6:35 **Foundation Medal of Honor**

6:40 **0481** Plenary Presentation with Mary Roach.

7:30 **Concluding Remarks**

Highlighted Posters

Mile High Lobby (Convention Center)

D3000 Entomological fiction: Bringing science to the public via mystery and murder. **Jeffrey Lockwood** (lockwood@uwyo.edu), Univ. of Wyoming, Laramie, WY

D3001 NIMBioS: Enhancing education at the interface between mathematics and biology. **Gregory J. Wiggins** (wiggybug@utk.edu), Suzanne Lenhart and Catherine Crawley, Univ. of Tennessee, Knoxville, TN

D3002 Engineering species-like barriers: A new paradigm for genetic biocontrol and biocontainment. **Maciej Maselko** (mmaselko@umn.edu), Stephen Heinsch, Jeremy Chacon, William Harcombe, Michael O'Connor and Michael Smanski, Univ. of Minnesota, St. Paul, MN

D3003 Fight of the bumble bee. **Ryan Reynolds** (rdr17@psu.edu), Pennsylvania State Univ., University Park, PA

D3004 Don't forget about the bio in bioinspired design. **Marianne Alleyne** (vanlaarh@life.illinois.edu), Univ. of Illinois, Champaign, IL

D3005 Effect of temperature on olfactory behavior in mosquitoes. **Chloé Lahondère** (lahonder@uw.edu), Jessica Liaw, Kennedy Tobin, Jillian Joiner, Clement Vinauger and Jeff Riffell, Univ. of Washington, Seattle, WA

D3006 A comparative study of cicada wing surface wettability and self-cleaning properties to aid in the design of innovative engineered materials. **Junho Oh** (junhooh2@illinois.edu)[1], Catherine Dana[1], Nenad Miljkovic[1], Donald M. Cropek[2], Kyoo Jo[2] and Marianne Alleyne[1], [1]Univ. of Illinois, Champaign, IL, [2]U.S. Army Engineer Research and Development Center, Champaign, IL

D3007 Landscapes for honey bees: Identifying landscape features that promote honey bee health through a citizen science partnership. **Tyler Jones** (toj2@psu.edu)[1], Margaret Douglas[1], Eric Lonsdorf[2], Douglas Miller[1], Maryann Frazier[1], Harland Patch[1], Christina M. Grozinger[1] and Amelie Davis[3], [1]Pennsylvania State Univ., University Park, PA, [2]Univ. of Minnesota, St. Paul, MN, [3]Miami Univ., Oxford, OH

Highlighted Virtual Posters

Mile High Lobby (Convention Center)

VP01 Distribution and functionality of cellulase genes in basal insects. **Nancy Calderón-Cortés** (ncalderon@enesmorelia.unam.mx), Roberto Marín-Paredes and Víctor Chávez-López, Univ. Nacional Autónoma de México, Morelia, Mexico

VP02 Species richness and phylogenetic diversity of associated host-plants of forest invasive alien insects. **Sandra Flores-Mejia** (sandra.flores-mejia@canada.ca)[1,2], Stephen Heard[2] and Deepa S. Pureswaran[1], [1]Natural Resources Canada, Québec City, QC, Canada, [2]Univ. of New Brunswick, Fredericton, NB, Canada

Grad Poster: MUVE, Blattodea, Hemiptera, and Others

Mile High Ballroom (Convention Center)

D3008 Inhibitors of detoxifying enzymes enhance toxicity of insecticides in resistant bed bugs. **Maria Gonzalez-Morales** (mgonzal@nmsu.edu) and Alvaro Romero, New Mexico State Univ., Las Cruces, NM

D3009 Comparative water relations and desiccation tolerance of five invasive ant species. **Olufemi Ajayi** (osa0001@auburn.edu)[1], Arthur Appel[1], Li Chen[2], Rammohan Rao Balusu[1] and Henry Fadamiro[1], [1]Auburn Univ., Auburn, AL, [2]The State Key Laboratory of Integrated Management of Pest Insects and Rodents, Beijing, China

D3010 Comparison of temperature dependent survivorship and wood consumption rate among two subterranean termite species (Isoptera: Rhinotermitidae: *Coptotermes*) and their hybrid. **Jayshree Patel** (jspatel.0111@gmail.com), Thomas Chouvenc and Nan-Yao Su, Univ. of Florida, Davie, FL

D3011 Toxicity and neurophysiological impacts of essential oil components on bed bug (*Cimex lectularius* L.). **Sudip Gaire** (sgaire@purdue.edu), Michael Scharf and Ameya Gondhalekar, Purdue Univ., West Lafayette, IN

D3012 Interaction of systemic acaricide with immunological control of *Rhipicephalus* (*Boophilus*) *microplus*. **Charluz Arocho** (marioli@tamu.edu)[1], Robert J. Miller[2], Pete Teel[1], Felix Guerrero[3] and Adalberto A. Pérez de León[3], [1]Texas A&M Univ., College Station, TX, [2]USDA - ARS, Edinburg, TX, [3]USDA - ARS, Kerrville, TX

D3013 Tracing a family tree of the tree-infesting black carpenter ant (*Camponotus pennsylvanicus*). **Adam Salyer** (asalyer@purdue.edu), Purdue Univ., West Lafayette, IN

D3014 Nitrogen fixation in different termite lineages and diets. **Aaron Mullins** (amull81@ufl.edu)[1] and Nan-Yao Su[2], [1]Univ. of Florida, Fort Lauderdale, FL, [2]Univ. of Florida, Davie, FL

Grad Poster: MUVE, Coleoptera and Diptera

Mile High Ballroom (Convention Center)

D3015 Eprinomectin as mosquito control and treated cattle as tools in the war against malaria. **Annie Rich** (aerich@uga.edu)[1], Nancy C. Hinkle[1] and Seth Irish[2], [1]Univ. of Georgia, Athens, GA, [2]Centers for Disease Control and Prevention, Atlanta, GA

D3016 Mosquitoes (Diptera: Culicidae) population present in Pueblo Bello, Cesar, Colombia. Martha González-Beltrán[1], **Margarita Ochoa-Diaz** (mdochoadiaz@gmail.com)[1], Helvio Astete[2], Eder Cano[1], Paola De Arcos[1], Julia Ampuero[3] and Doris Gómez Camargo[1], [1]Univ. de Cartagena, Cartagena, Colombia, [2]U.S. Naval Medical Research Unit - 6, Iquitos, Peru, [3]U.S. Naval Medical Research Unit - 6, Lima, Peru

D3017 Investigation of the seasonal variation of the larval stages of Diptera present during decomposition of human remains in southeast Texas. **Bethany Walker** (bah029@shsu.edu) and Sibyl Bucheli, Sam Houston State Univ., Huntsville, TX

D3018 Application and efficacy of three alternative fumigants for storage pests. **Jacqueline Maille** (jmaille@ksu.edu), Michael J. Aikins, Salehe Abbar and Thomas Phillips, Kansas State Univ., Manhattan, KS

D3019 Presentation withdrawn

D3020 Relative toxicities of avermectin-treated blood meals in *Anopheles* mosquitoes. **Staci Dreyer** (staci.dreyer@und.edu), Kelsey Morin and Jefferson Vaughan, Univ. of North Dakota, Grand Forks, ND

Grad Poster: PBT, Araneae, Coleoptera, Hemiptera, Strepsiptera, and Scorpiones

Mile High Ballroom (Convention Center)

D3021 ATP-sensitive inwardly rectifying potassium channel modulators alter cardiac function in honey bees. **Scott O'Neal** (soneal3@unl.edu)[1], Daniel Swale[2], Jeffrey Bloomquist[3] and Troy Anderson[1], [1]Univ. of Nebraska, Lincoln, NE, [2]Louisiana State Univ., Baton Rouge, LA, [3]Univ. of Florida, Gainesville, FL

D3022 Optimized CRISPR/Cas9 tools in the stored grain pest and coleopteran model *Tribolium castaneum*. **Nicole Gutzmann** (negutzma@ncsu.edu) and Marcé Lorenzen, North Carolina State Univ., Raleigh, NC

D3023 RNA interference in brown marmorated stink bug. **Priyanka Mittapelly** (mittapelly.1@buckeyemail.osu.edu) and Andy Michel, The Ohio State Univ., Wooster, OH

D3024 High dose strategies for controlling phosphine-resistant populations of *Rhyzopertha dominica* in North America. **Edwin Afful** (eddafful@ksu.edu) and Thomas Phillips, Kansas State Univ., Manhattan, KS

D3025 The effects of temperature on the nutritional ecology of arthropod predators. **Ryan Walker** (rcw88@scarletmail.rutgers.edu) and Angélica González, Rutgers, The State Univ. of New Jersey, Camden, NJ

D3026 Dopamine and norepinephrine as neuromodulators of arachnid behavior: Anatomical and physiological insights from the scorpion *Centruroides sculpturatus* (Scorpiones: Buthidae). **Anthony Auletta** (aulet002@umn.edu), Anthony Bigelow, Morgan Newhoff and Karen Mesce, Univ. of Minnesota, St. Paul, MN

D3027 Quantifying neonicotinoid runoff from agricultural fields into nearby aquatic systems. **Sarah McTish** (stm5283@psu.edu) and John Tooker, Pennsylvania State Univ., University Park, PA

D3028 Epigenetic regulation of hormone action and development in the red flour beetle, *Tribolium castaneum* (Herbst). **Smitha George** (smitha.george@uky.edu) and Subba Reddy Palli, Univ. of Kentucky, Lexington, KY

D3029 A nutritional profile of the emerald ash borer (*Agrilus planipennis* Fairmaire) during larval and adult developmental stages. **Tyler Spresser** (tsspresser1s@semo.edu)[1], Timothy M. Judd[1] and Benjamin Slager[2], [1]Southeast Missouri State Univ., Cape Girardeau, MO, [2]USDA - Rural Development, Grand Rapids, MI

Grad Poster: PBT, Diptera

Mile High Ballroom (Convention Center)

D3030 Elucidating the function of transferrin in *D. melanogaster* through biochemical and structural analysis. **Jacob Weber** (jjweber@ksu.edu), Lisa Brummett, Brian Geisbrecht, Michael Kanost and Maureen Gorman, Kansas State Univ., Manhattan, KS

D3031 Gap junctions and crop contraction of *Aedes aegypti*. **Travis Calkins** (calkins.21@osu.edu) and Peter Piermarini, The Ohio State Univ., Wooster, OH

D3032 Mating-receptivity in female *Teleopsis dalmanni* is mediated by daily fluctuations of dopamine levels. **Erin Sanders** (erin.sanders@ucdenver.edu)[1], Andrew Bubak[2], Kenneth Renner[3] and John Swallow[1], [1]Univ. of Colorado, Denver, CO, [2]Univ. of Colorado, Aurora, CO, [3]Univ. of South Dakota, Vermillion, SD

D3033 Characterization of two carboxylesterases in pyrethroid resistant house flies, *Musca domestica*. **Xuechun Feng** (xzf0005@auburn.edu) and Nannan Liu, Auburn Univ., Auburn, AL

D3034 Repellent reception in the yellow fever mosquito *Aedes aegypti*. **Zhou Chen** (zzc0012@auburn.edu), Feng Liu and Nannan Liu, Auburn Univ., Auburn, AL

Grad Poster: PBT, Hymenoptera

Mile High Ballroom (Convention Center)

D3035 Chronic contact exposure to realistic soil concentrations of a neonicotinoid pesticide during development has important sublethal effects on solitary bees. **Nicholas Anderson** (nlndrsn2@illinois.edu) and Alexandra Harmon-Threatt, Univ. of Illinois, Champaign, IL

D3036 Gut symbiont viability in honey bees exposed to chemical stressors. **Bryant Gabriel** (bgabriel@huskers.unl.edu) and Troy Anderson, Univ. of Nebraska, Lincoln, NE

D3037 Assessing toxicity of formulated pesticide mixtures to different bee species. **Joseph Belsky** (jebelsky@email.uark.edu) and Neelendra Joshi, Univ. of Arkansas, Fayetteville, AR

D3038 Characterizing the hemocytes of the honey bee, *Apis mellifera*, using various morphological and functional analyses. **Rodney Richardson** (richardson.827@osu.edu)[1], Megan Ballinger[1], Feng Qian[1], John Christman[1] and Reed Johnson[2], [1]The Ohio State Univ., Columbus, OH, [2]The Ohio State Univ., Wooster, OH

D3039 Impact of pesticide residue on Japanese orchard bees (*Osmia cornifrons*) larval development and mortality. **Ngoc Phan** (ngocpata@gmail.com), Pennsylvania State Univ., University Park, PA

D3040 The role of dopamine in the regulation of foraging in the red harvester ant. **Daniel Friedman** (danielarifriedman@gmail.com)[1], Anna Pilko[2], Karolina Krasinska[1], Dorota Skowronska-Krawczyk[3] and Deborah M. Gordon[1], [1]Stanford Univ., Stanford, CA, [2]Univ. of California, Los Angeles, CA, [3]Univ. of California, La Jolla, CA

Grad Poster: PBT, Lepidoptera

Mile High Ballroom (Convention Center)

D3041 Identification and description of serpins in *Manduca sexta*. **Miao Li** (limiao@ksu.edu)[1], Jayne M. Christen[1], Xiaolong Cao[2], Neal Dittmer[1], Michael Kanost[1] and Haobo Jiang[2], [1]Kansas State Univ., Manhattan, KS, [2]Oklahoma State Univ., Stillwater, OK

D3042 Tissue damage causes changes in the hormone profile of the tobacco hornworm, *Manduca sexta*. **Manuel Rosero** (maroro9203@gmail.com)[1], Benedict Abdon[2], Ernie Chang[3] and Megumi Fuse[1], [1]San Francisco State Univ., San Francisco, CA, [2]Univ. of Michigan, Ann Arbor, MI, [3]Univ. of California, Bodega Bay, CA

D3043 Protection and RNA delivery properties of porous silica nanoparticles in *Spodoptera frugiperda* cells. **Emily Nadeau** (eana226@g.uky.edu), M. Arif Khan, Shanshan Zhou, Barbara Knutson, Stephen Rankin and Bruce Webb, Univ. of Kentucky, Lexington, KY

D3044 Presentation withdrawn

D3045 Gene expression corn earworm caterpillars and maize tissues. **Faisal Alsubaie** (fm-alsubaie2@wiu.edu), Ammar Al-Furaiji, Kayleigh Diveley and Richard Musser, Western Illinois Univ., Macomb, IL

D3046 Caterpillar gene expression on different host plants. **Ammar Al-Furaiji** (akk-al-furaiji@wiu.edu), Donald Bath and Richard Musser, Western Illinois Univ., Macomb, IL

D3047 The cockroach neuropeptide leucopyrokinin inhibits sensitization of the defensive strike response in the hornworm, *Manduca sexta*. **Alicia Rice** (arice4@mail.sfsu.edu) and Megumi Fuse, San Francisco State Univ., San Francisco, CA

Grad Poster: P-IE, Honey Bees

Mile High Ballroom (Convention Center)

D3048 Field-level fungicide exposure to honey bees (*Apis mellifera*) during orchard bloom in Michigan. **Jacquelyn Albert** (albertj9@msu.edu) and Julianna Wilson, Michigan State Univ., East Lansing, MI

D3049 Contamination of bee-collected pollen in multiple landscapes. **Jon Zawislak** (jzawislak@uaex.edu)[1], John Adamczyk[2], Gus Lorenz[3] and Neelendra Joshi[4], [1]Univ. of Arkansas, Little Rock, AR, [2]USDA - ARS, Poplarville, MS, [3]Univ. of Arkansas, Lonoke, AR, [4]Univ. of Arkansas, Fayetteville, AR

D3050 Molecular survey for the honey bee trypanosome parasites *Crithidia mellificae* and *Lotmaria passim*. **Mary-Kate Williams** (mfwillia@email.uark.edu) and Allen Szalanski, Univ. of Arkansas, Fayetteville, AR

D3051 Linking landscapes to honey bee (*Apis mellifera*) health in southern Michigan. **Gabriela Quinlan** (quinlang@msu.edu)[1], Meghan Milbrath[1], Rufus Isaacs[1] and Clint Otto[2], [1]Michigan State Univ., East Lansing, MI, [2]U.S. Geological Survey, Jamestown, ND

D3052 Transgenerational stress inheritance in the honey bee (*Apis mellifera*): The impacts of queen stress on worker behavior and health. **Sarah Preston** (sarah.peaslee@uky.edu) and Clare Rittschof, Univ. of Kentucky, Lexington, KY

Grad Poster: P-IE, Behavior

Mile High Ballroom (Convention Center)

D3053 Co-occurrences and behavioral interactions of wild bees and managed honey bees on flowering plants. **Bianca Rendon** (bianca.rendon@ttu.edu) and Scott Longing, Texas Tech Univ., Lubbock, TX

D3054 Oviposition behavior of *Sirex noctilio* (Hymenoptera: Siricidae) in China. **Qiang Xu** (xuqiangbj@foxmail.com) and Juan Shi, Beijing Forestry Univ., Beijing, China

D3055 Impact of host plant composition on bird cherry-oat aphid (*Rhopalosiphum padi*) feeding behavior. **Dayna Collett** (dayna.collett@okstate.edu) and Kris Giles, Oklahoma State Univ., Stillwater, OK

D3056 The behavioral responses of hunting billbugs towards different turfgrass species. **Michael Patterson** (mep625@mail.missouri.edu), Bruce Barrett and Xi Xiong, Univ. of Missouri, Columbia, MO

D3057 Influence of drought on western flower thrips omnivorous feeding behavior. **Joe Krauska** (jjkfy6@ksu.edu)[1], Mary Hedenberg[1], Sarah Zukoff[2] and James Nechols[1], [1]Kansas State Univ., Manhattan, KS, [2]Kansas State Univ., Garden City, KS

D3058 Attraction of *Paratelenomus saccharalis* (Hymenoptera: Platygastridae), an egg parasitoid of *Megacopta cribraria* (Hemiptera: Plataspidae), to host-associated olfactory cues. **Blessing Ademokoya** (bfa0003@auburn.edu)[1,2], Rammohan Rao Balusu[1], Tolulope Morawo[1] and Henry Fadamiro[1], [1]Auburn Univ., Auburn, AL, [2]Univ. of Nebraska, Lincoln, NE

Grad Poster: P-IE, Biocontrol and Parasitoids

Mile High Ballroom (Convention Center)

D3059 Food preferences of most prevalent aphidophagous hoverflies *Episyrphus balteatus* and *Ischizodon scutellaris* in Sindh, Pakistan. Roshan Jamali and **Nasreen Memon** (nasreen_kousarbks@hotmail.com), Univ. of Sindh, Jamshoro, Pakistan

D3060 Emerald ash borer biological control, adult parasitoid competition, emergence synchrony, and woodpecker interactions. **Max Ragozzino** (maxri@vt.edu)[1], Scott Salom[1] and Jian Duan[2], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]USDA - ARS, Newark, DE

D3061 Enhancing biological control in vegetable production of eastern Maryland and Virginia. **Christopher McCullough** (ctmccull@vt.edu) and Megan E. O'Rourke, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

D3062 Assessment of the impact of the egg parasitoid, *Paratelenoumus saccharalis* (Hymenoptera: Platygastridae) on populations of the kudzu bug, *Megacopta cribraria* (Hemiptera: Plataspidae). **Worrel Diedrick** (worrell1.diedrick@famu.edu)[1], Lambert Kanga[1], Muhammad Haseeb[1], Jesusa C. Legaspi[2] and Anthony Ananga[1], [1]Florida A&M Univ., Tallahassee, FL, [2]USDA - ARS, Tallahassee, FL

D3063 Parasitic Hymenoptera associated with blackberries bordered by native perennial and pasture border rows in Frankfort, Kentucky. **Kyle Slusher** (eddie.slusher@kysu.edu), John Sedlacek, Karen Friley and Mamata Bashyal, Kentucky State Univ., Frankfort, KY

D3064 Diversity of ground beetles associated with Texas cotton. **Muhammad Ismail** (ismailbilu2643@gmail.com)[1], Abdul Hakeem[2], Katie Lewis[2] and Megha Parajulee[2], [1]Univ. of Sargodha, Sargodha, Pakistan, [2]Texas A&M Univ., Lubbock, TX

D3065 Presentation withdrawn

D3066 Land stewardship and native predators: Potential of dragonflies as biocontrol agents in cranberry systems. **Maria Chavez** (mchavez4@wisc.edu)[1], Elissa M. Chasen[1], Jonathan Lundgren[2] and Shawn Steffan[3], [1]Univ. of Wisconsin, Madison, WI, [2]Ecdysis Foundation, Estelline, SD, [3]USDA - ARS, Madison, WI

D3067 Effects of endophytic *Beauveria bassiana* in tomato varieties on adult mite density *Tetranychus evansi* in the screen house. **Carolyne Omukoko** (canaye3@yahoo.com)[1,2], Turoop Losenge[1], Jean Nguya Kalemba Maniania[2] and Vitalis Wekesa[3], [1]Jomo Kenyatta Univ. of Agriculture and Technology, Nairobi, Kenya, [2]International Centre of Insect Physiology and Ecology, Nairobi, Kenya, [3]Kenya Polytechnic Univ. College, Nairobi, Kenya

D3068 Detection of potential biocontrol agents and their synchrony with clover root curculio (Coleoptera: Curculionidae) phenology in alfalfa soils. **Kaitlin Rim** (krim19@aggiemail.usu.edu), Steven Price and Ricardo Ramirez, Utah State Univ., Logan, UT

Grad Poster: P-IE, Chemical Ecology and Climate Change

Mile High Ballroom (Convention Center)

D3069 The role of mycorrhizae and nutrient availability in plant-herbivore interactions. **Zoe Getman-Pickering** (zg94@cornell.edu) and Jennifer Thaler, Cornell Univ., Ithaca, NY

D3070 Natural enemy attraction to herbivore induced asparagus volatiles. **Adam Ingrao** (ingraoad@msu.edu) and Zsofia Szendrei, Michigan State Univ., East Lansing, MI

D3071 The effects of dietary phytochemical supplementation on honey bee longevity. **Alison Hogebooom** (alison.hogeboom@colostate.edu) and Arathi Seshadri, Colorado State Univ., Fort Collins, CO

D3072 Breakdown of neotropical plant-pollinator relationships in the wake of climate change. **Theresa Wolanin** (twolani1@kent.edu), Kent State Univ., Kent, OH

D3073 Attraction of native bees to Japanese beetle lures and traps. **Steven Sipolski** (steven_sipolski@my.uri.edu), Sara Datson, Rebecca Gumbrewicz and Steven Alm, Univ. of Rhode Island, Kingston, RI

D3074 Do herbivorous insects cause a differential investment in secondary metabolites of plants? **Cindy Perkovich** (cthoma16@kent.edu), Kent State Univ., Kent, OH

D3075 Aphid community structure influenced by environmental variation over large spatial and temporal scales. **Courtney Larson** (larso126@msu.edu), Michigan State Univ., East Lansing, MI

D3076 Cabbage looper salivary ROS scavengers affect plant induced defenses. **Loren Rivera Vega** (ljr181@psu.edu) and Gary Felton, Pennsylvania State Univ., University Park, PA

D3077 The role of temperature on insect-plant interactions in a warming world. **Sulav Paudel** (sup215@psu.edu), Edwin Rajotte and Gary Felton, Pennsylvania State Univ., University Park, PA

D3078 Electroantennogram response of the parasitoid, *Microplitis croceipes* to host-related odors: The discrepancy between relative abundance and level of antennal responses to volatile compound. **Tolulope Morawo** (tom0002@auburn.edu)[1], Matthew Burrows[2] and Henry Fadamiro[1], [1]Auburn Univ., Auburn, AL, [2]Centers for Disease Control and Prevention, Atlanta, GA

Grad Poster: P-IE, Ecology

Mile High Ballroom (Convention Center)

D3079 Body size influences stingless bee (Apidae: Meliponini) community assemblages across a range of deforestation levels in Rondonia, Brazil. **Daphne Mayes** (dmayes@ku.edu), Chet Bhatta, J. Christopher Brown, Di Shi and Deborah Smith, Univ. of Kansas, Lawrence, KS

D3080 Merging insecticide application and land use change to model threats to registered apiaries in North Dakota from 2000-2014. **Daniel Dixon** (d.dixon@und.edu)[1], Haochi Zheng[1] and Clint Otto[2], [1]Univ. of North Dakota, Grand Forks, ND, [2]U.S. Geological Survey, Jamestown, ND

D3081 Building better bee habitats: Local and landscape drivers of urban hymenopteran nesting. **Katherine Todd** (kjtodd91@gmail.com) and Mary Gardiner, The Ohio State Univ., Columbus, OH

D3082 Landscape and seasonal effects on beneficial insects in agricultural crops of Utah. **Morgan Christman** (christ_m1@denison.edu)[1], Lori R. Spears[1], Terry Griswold[2] and Ricardo Ramirez[1], [1]Utah State Univ., Logan, UT, [2]USDA - ARS, Logan, UT

D3083 Tell me what you eat, and I will tell you what mandibles you have. **Flor E. Acevedo** (fea5007@psu.edu), Michelle Peiffer and Gary Felton, Pennsylvania State Univ., University Park, PA

D3084 The impact of strip tillage and cover crops on pests and beneficials in organic squash. **Sarah Galley** (galleysa@msu.edu) and Zsofia Szendrei, Michigan State Univ., East Lansing, MI

D3085 Leafhopper (Hemiptera: Cicadellidae) probing preferences on *Bothriochloa ischaemum* stem and seed head tissues. **Natalie Gahm** (ngahm@okstate.edu), Astri Wayadande and W. Wyatt Hoback, Oklahoma State Univ., Stillwater, OK

D3086 Impact of winter feeding on overwintering *Hippodamia convergens* (Coccinellidae) survival and spring reproduction. **Nathan Mercer** (nhmercer13@gmail.com), Nicholas Teets, Ric Bessin and John Obrycki, Univ. of Kentucky, Lexington, KY

D3087 Species distribution models of the western bumble bee, *Bombus occidentalis*, in Wyoming using historic and current data. **Christine Bell** (cbell@uwyo.edu), Michael E. Dillon and Lusha Tronstad, Univ. of Wyoming, Laramie, WY

D3088 Assessing spatial distribution of chilli thrips, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) in Florida berries. **Babu Panthi** (panthibabu@ufl.edu) and Justin Renkema, Univ. of Florida, Wimauma, FL

D3089 Agroecological methods to manage brassica pests on organic farms. **Madeline Marshall** (madeline.marshall01@utrgv.edu), Alexis Racelis and Pushpa Soti, Univ. of Texas, Edinburg, TX

D3090 Population genetic structure and relationships of *Bemisia tabaci* (Hemiptera: Aleyrodidae) in Asia by using microsatellite markers. **Yujeong Park** (bravohpark@snu.ac.kr), Hwa Yeun Nam and Joon-Ho Lee, Seoul National Univ., Seoul, South Korea

Grad Poster: P-IE, Host Plant Resistance

Mile High Ballroom (Convention Center)

D3091 Comparisons of the transcriptomes of *Dectes texanus* (Coleoptera: Cerambycidae) larvae fed soybean, sunflower and giant ragweed. **Lina Aguirre-Rojas** (liaguiro@ksu.edu) and C. Michael Smith, Kansas State Univ., Manhattan, KS

D3092 Investigating the potential for *Lissorhoptrus oryzophilus* to induce resistance in rice, *Oryza sativa*, to subsequent rice herbivores. **Emily Kraus** (ekraus@agcenter.lsu.edu) and Michael Stout, Louisiana State Univ., Baton Rouge, LA

D3093 Greenbug resistance and the *Dn7* gene from rye - Potential cross-taxa insect resistance in wheat. **Catherine Stewart** (clstewart01@ksu.edu) and C. Michael Smith, Kansas State Univ., Manhattan, KS

D3094 Does phylogenetic relatedness affect associational resistance? A test with vegetable crops. **Angela Coco** (amc604@psu.edu)[1], Ian Kaplan[2] and John Tooker[1], [1]Pennsylvania State Univ., University Park, PA, [2]Purdue Univ., West Lafayette, IN

D3095 Mir1-CP mediated maize resistance against corn leaf aphid. **Suresh Varsani** (ssvarsani@gmail.com), Saumik Basu and Joe Louis, Univ. of Nebraska, Lincoln, NE

D3096 Glandular trichome-derived terpenes of wild tomato accessions affect aphid performance and feeding behavior. **Fumin Wang** (fw0003@mix.wvu.edu), Yong-Lak Park and Michael Gutensohn, West Virginia Univ., Morgantown, WV

D3097 Sorghum-fall armyworm interaction: Identifying novel sources of insect resistance. **Sajjan Grover** (sajjan.grover@huskers.unl.edu)[1], Scott E. Sattler[2] and Joe Louis[1], [1]Univ. of Nebraska, Lincoln, NE, [2]USDA - ARS, Lincoln, NE

D3098 Unraveling the role of epicuticular wax in rice defense against insects. **Lina Bernaola** (lbernaola@agcenter.lsu.edu)[1], Thomas Tai[2] and Michael Stout[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]USDA - ARS, Davis, CA

D3099 Categories of resistance to sugarcane aphid (Hemiptera: Aphididae) in different sorghum germplasms. **Sulochana Paudyal** (sulochana.paudyal@okstate.edu)[1], J. Scott Armstrong[2], Kris Giles[1] and Ankur Limaje[1], [1]Oklahoma State Univ., Stillwater, OK, [2]USDA - ARS, Stillwater, OK

Grad Poster: P-IE, Invasive Species

Mile High Ballroom (Convention Center)

D3100 Seasonal changes in cold tolerance by the invasive larch casebearer. **Samuel J. Fahrner** (fahr0051@umn.edu)[1], Robert Venette[2] and Brian Aukema[1], [1]Univ. of Minnesota, St. Paul, MN, [2]USDA - Forest Service, St. Paul, MN

D3101 Potential invasive weevil pests between North America and China: Pest risk analysis and invasion pathways. **Jing Zhang** (jing1.zhang@famu.edu)[1,2], Runzhi Zhang[2], Muhammad Haseeb[1] and Lambert Kanga[1], [1]Florida A&M Univ., Tallahassee, FL, [2]Chinese Academy of Sciences, Beijing, China

D3102 Efficacy of short exposure to systemic insecticides on coconut rhinoceros beetle (*Oryctes rhinoceros*) adults. **Matthew Kellar** (kellarm@hawaii.edu) and Zhiqiang Cheng, Univ. of Hawai'i, Honolulu, HI

D3103 Brown marmorated stink bug oviposition on trees within non-managed wooded borders and urban environments. **Adam Formella** (adam4@vt.edu) and Thomas P. Kuhar, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

D3104 What can biosurveillance for emerald ash borer tell us? **Marie Hallinen** (halli154@umn.edu) and Brian Aukema, Univ. of Minnesota, St. Paul, MN

D3105 Effects of emerald ash borer on riparian forest structure. **Patrick Engelken** (engelke2@msu.edu), Deborah G. McCullough, Courtney Larson and M. Eric Benbow, Michigan State Univ., East Lansing, MI

Grad Poster: P-IE, IPM, Field Crops 1

Mile High Ballroom (Convention Center)

D3106 Movement and spatial pattern of soybean aphid on aphid-resistant and -susceptible soybean. **Obiratanea Da Silva Queiroz** (oqueiroz@umn.edu), Anthony Hanson and Robert Koch, Univ. of Minnesota, St. Paul, MN

D3107 Assessing sampling methods for the Asiatic garden beetle, *Maladera castanea*, in corn. **Adrian Pekarcik** (pekarcik.4@osu.edu)[1], Eric Richer[2] and Kelley Tilmon[1], [1]The Ohio State Univ., Wooster, OH, [2]The Ohio State Univ., Wauseon, OH

D3108 Transgenic Bt corn, soil insecticide, and insecticidal seed treatment effects on northern corn rootworm (Coleoptera: Chrysomelidae) beetle emergence in North Dakota. **Veronica Calles Torrez** (veronica.callestorre@ndus.edu)[1], Janet Knodel[1], Mark Boetel[1], Bryan French[2] and Billy Fuller[3], [1]North Dakota State Univ., Fargo, ND, [2]USDA - ARS, Brookings, SD, [3]South Dakota State Univ., Brookings, SD

D3109 Overcoming RNAi barriers to recalcitrant insects using next-gen approaches. **Mosharrof Mondal** (mdmosharrofhossain.mondal@eagles.usm.edu), Keith Parsons, Charles McCormick and Alex Flynt, Univ. of Southern Mississippi, Hattiesburg, MS

D3110 Detecting sugarcane aphid (*Melanaphis sacchari*) infestation in grain sorghum (*Sorghum bicolor*) using leaf spectral response. **Grace Craigie** (craigieg@ksu.edu), Brian McCornack, Ignacio Ciampitti and Douglas Goodin, Kansas State Univ., Manhattan, KS

D3111 Contribution of maize hybrid genetics and water stress in the mitigation of pre-harvest losses attributed to Lepidopteran feeding. **Luke Pruter** (lukespruter@gmail.com)[1], Michael Brewer[1], Thomas Isakeit[2] and Seth Murray[2], [1]Texas A&M Univ., Corpus Christi, TX, [2]Texas A&M Univ., College Station, TX

D3112 Development of thresholds for management of sugarcane aphid on sorghum. **John Gordy** (john.gordy@ag.tamu.edu)[1,2], Michael Brewer[3], David Kerns[2], G. David Buntin[4], Nick Seiter[5], Robert Bowling[3] and Michael (Mo) Way[6], [1]Texas A&M Univ., Rosenberg, TX, [2]Texas A&M Univ., College Station, TX, [3]Texas A&M Univ., Corpus Christi, TX, [4]Univ. of Georgia, Griffin, GA, [5]Univ. of Arkansas, Monticello, AR, [6]Texas A&M Univ., Beaumont, TX

D3113 Evaluating the impacts of seed treatment and cover crop on soybean. **Cole Dierks** (cole.dierks@sdstate.edu), Philip Rozeboom, Brady Hauswedell and Adam Varenhorst, South Dakota State Univ., Brookings, SD

D3114 Distribution and abundance of flea beetles in canola in North Dakota. **Lesley Lubenow** (lesley.lubenow@ndsu.edu)[1], Janet Knodel[2] and Patrick Beauzay[2], [1]North Dakota State Univ., Langdon, ND, [2]North Dakota State Univ., Fargo, ND

D3115 Effect of aphid density on the development of soybean aphid, *Aphis glycines* (Hemiptera: Aphididae) winged morphs. **Stephen Losey** (slosey88@ksu.edu) and Brian McCornack, Kansas State Univ., Manhattan, KS

D3116 Phenotypic performance of different genotypes of fall armyworm possessing Cry1A.105 and Cry2Ab2 resistance alleles on MON89034 corn. **Ying Niu** (yniu1@lsu.edu)[1], Yiwan Zhou[1], Graham P. Head[2], Paula A. Price[2] and Fangneng Huang[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Monsanto Company, St. Louis, MO

Grad Poster: P-IE, IPM, Field Crops 2

Mile High Ballroom (Convention Center)

D3117 Ecological services as mediated by citrus phenology: Aphid abundance and diversity, and its implications on aphidiine parasitoids (Braconidae) in Puerto Rico. **Darsy Smith** (darsy.smith@upr.edu)[1], Alejandro Segarra[1] and Rosa A. Franqui[2], [1]Univ. of Puerto Rico, Mayaguez, PR, [2]Museo de Entomología y Biodiversidad Tropical, San Juan, PR

D3118 Dispersal and risk assessment of walnut twig beetle, *Pityophthorus juglandis*, in forests. **Philip Hensley** (phensle2@vols.utk.edu), Jerome F. Grant, Mark T. Windham, Paris L. Lambdin and Gregory J. Wiggins, Univ. of Tennessee, Knoxville, TN

D3119 Selecting native perennial plants to support natural enemies in Michigan. **Dan Gibson** (gibso124@msu.edu), Logan Rowe, Rufus Isaacs and Douglas A. Landis, Michigan State Univ., East Lansing, MI

D3120 Evaluation of galls caused by Asian chestnut gall wasp on chestnut cultivars in commercial orchards in Michigan. **Louise Labbate** (daquilal@msu.edu) and Deborah McCullough, Michigan State Univ., East Lansing, MI

D3121 Alternative control strategies to reduce damages by storage insect pests of sorghum grain in Niger (West Africa). **Hame Abdou Kadi Kadi** (hkadikadi@yahoo.com)[1,2] and Bonnie Pendleton[1], [1]West Texas A&M Univ., Canyon, TX, [2]Institut National de la Recherche Agronomique, Niamey, Niger

D3122 The efficacy of prophylactic insecticide use and economic feasibility in Indiana maize: A meta-analysis. **Adam Alford** (adammalford@gmail.com) and Christian Krupke, Purdue Univ., West Lafayette, IN

D3123 What's buggin' hemp in Tennessee? **Cody Seals** (wseals@utk.edu)[1], Jerome F. Grant[1], Clint Palmer[2], Frank Hale[3] and Darrell Hensley[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Middle Tennessee State Univ., Murfreesboro, TN, [3]Univ. of Tennessee, Nashville, TN

D3124 Efficacy of chlorantraniliprole seed treatment on *Diatraea saccharalis* (Lepidoptera: Crambidae) at vegetative and reproductive stages of drill-seeded rice. **James Michael Villegas** (jamesvillegas12@gmail.com) and Michael Stout, Louisiana State Univ., Baton Rouge, LA

D3125 Alternatives to neonicotinoid insecticides for thrips management in cotton. **Sarah Hobby** (shobby@uga.edu), Sriyanka Lahiri and Michael Toews, Univ. of Georgia, Tifton, GA

D3126 Effects of Bt maize expressing Cry1F and Vip3A on *Striacosta albicosta* (Smith) (Lepidoptera: Noctuidae) immature stages. **Débora Montezano** (deiagm@gmail.com)[1], Thomas Hunt[2], Priscila Colombo Da Luz[3] and Julie Peterson[3], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, Concord, NE, [3]Univ. of Nebraska, North Platte, NE

D3127 Optimizing yield environments and soybean genetics for soybean aphid management. **Ashley Dean** (adean@iastate.edu), Shelby Pritchard, Matthew O'Neal and Erin Hodgson, Iowa State Univ., Ames, IA

Grad Poster: P-IE, IPM, Horticulture and Pollination

Mile High Ballroom (Convention Center)

D3128 Phenology and cultivar preference of *Erythroneura comes* (Hemiptera: Cicadellidae) in Oklahoma vineyards. **Kevin Jarrell** (kevin.jarrell@okstate.edu), Eric Rebek, Astri Wayadande and Kris Giles, Oklahoma State Univ., Stillwater, OK

D3129 Development of native pollinator habitat within livestock pasture ecosystem. **Roshani Sharma Acharya** (rsharmaa@uark.edu)[1], Joan Burke[2] and Neelendra Joshi[1], [1]Univ. of Arkansas, Fayetteville, AR, [2]USDA - ARS, Booneville, AR

D3130 Development of a molecular test (Diagnostic PCR) for identification of lepidopteran pests in almonds. **Rohith Vulchi** (rohithkarthikvulchi@gmail.com)[1], Jacob Wenger[1] and Kent Daane[2], [1]California State Univ., Fresno, CA, [2]Univ. of California, Parlier, CA

D3131 Laboratory evaluation of efficacy of entomopathogenic nematodes and plant based oils against Texas leafcutting ants, *Atta texana* (Hymenoptera: Formicidae). **Quentin Van Camp** (quentin.vancamp@utrgv.edu)[1], Pushpa Soti[2] and Alexis Racelis[2], [1]Univ. Catholique de Louvain, Louvain-la-Neuve, Belgium, [2]Univ. of Texas, Edinburg, TX

D3132 Abundance of the native bees and managed honey bees across pumpkin fields on the Texas High Plains. **Christopher Jewett** (christopher.jewett@ttu.edu) and Scott Longing, Texas Tech Univ., Lubbock, TX

D3133 Interactions between *Halyomorpha halys* injury and *Zaprionus indianus* oviposition in raspberries. **Ian Sandum** (celeborn@vt.edu) and Douglas G. Pfeiffer, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

D3134 Assessing the effects of the Conservation Reserve Program on cavity-nesting bees in Colorado agroecosystems. **Alexandra Morphew** (alexandra.r.morphew@gmail.com)[1], Adrian L. Carper[2], M. Deane Bowers[2] and Mary A. Jamieson[3], [1]Wichita State Univ., Wichita, KS, [2]Univ. of Colorado, Boulder, CO, [3]Oakland Univ., Rochester, MI

D3135 Effectiveness of *Xylocopa virginica* (Hymenoptera: Apidae) in pollination of highbush blueberry (*Vaccinium corymbosum*). **Sara Tucker** (sara_tucker@uri.edu) and Steven Alm, Univ. of Rhode Island, Kingston, RI

D3136 Do native plants attract more bees than non-natives? A comparative study of native and non-native ornamental plants. **Carter Westerhold** (westerhold.carter@gmail.com), Kim Todd, Sam Wortman and Douglas Golick, Univ. of Nebraska, Lincoln, NE

D3137 Integration of insectary plants with trap crops to attract natural enemies and suppress insect pests in an organic cabbage agro-eco system. **Binita Shrestha** (bswc2@mail.missouri.edu)[1], Debbie Finke[1] and Jaime Pinero[2], [1]Univ. of Missouri, Columbia, MO, [2]Lincoln Univ., Jefferson City, MO

D3138 Diversity and frequency of pollinators visiting annual and perennial pollinator attracting plants adjacent to vegetable crops. **John Montoya** (montoyaj@tamu.edu)[1], Juliana Rangel[1], Michael Arnold[1], Marco Palma[1] and Larry Stein[2], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., Uvalde, TX

Grad Poster: P-IE, Vectors of Plant Disease and Resistance Management

Mile High Ballroom (Convention Center)

D3139 Fruit odor olfactome of four tephritid pests can be used in developing novel female attractants. **Tibebe Dejene Biasazin** (tibejene@gmail.com)[1,2], Sebastian Larsson Herrera[1] and Teun Dekker[1], [1]Swedish Univ. of Agricultural Sciences, Alnarp, Sweden, [2]Addis Ababa Univ., Addis Ababa, Ethiopia

D3140 The effects of urbanization on the diversity of pollen collected by bees in west-central Illinois, and the impact that pollen diversity has on the bee's gut microbiome. **Jacob Torres** (jd-torres@wiu.edu), Kendall Smith, Catherine Miller-Hunt and Kenneth W. McCravy, Western Illinois Univ., Macomb, IL

D3141 Pollen microbiome of bee species (Hymenoptera: Anthophila) of western Illinois. **Kendall Smith** (km-smith2@wiu.edu), Jacob Torres, Catherine Miller-Hunt and Kenneth W. McCravy, Western Illinois Univ., Macomb, IL

D3142 Why don't queens get broody? Parasites, mating status, and ovary development in *Bombus huntii.* **Jessica Mullins** (jessica.mullins@ars.usda.gov), Amber D. Tripodi and James Strange, USDA - ARS, Logan, UT

D3143 Presentation withdrawn

D3144 Composition and prediction of wheat curl mite biotypes prevalent in the U.S. Great Plains. **Luaay Khalaf** (luaay_kalani@yahoo.com)[1], Wen-Po Chuang[2], Lina Aguirre-Rojas[1], Alicia Timm[3], Laramy Enders[4], Peter Klein[1], Trevor Hefley[1], Allan Fritz[1] and C. Michael Smith[1], [1]Kansas State Univ., Manhattan, KS, [2]National Taiwan Univ., Taipei, Taiwan, [3]Colorado State Univ., Fort Collins, CO, [4]Purdue Univ., West Lafayette, IN

D3145 Investigating vector-virus-plant interactions influencing transmission efficiency of *tomato yellow leaf curl virus* and *tomato mottle virus* by *Bemisia tabaci*. **Shuang Gong** (szg0067@auburn.edu), Ashley Bowler, Gabriela Calvillo and Alana Jacobson, Auburn Univ., Auburn, AL

D3146 Presentation withdrawn

D3147 Acaricide resistance of the two-spotted spider mite in hop fields. **Adekunle Adesanya** (adekunle.adesanya@wsu.edu)[1], Meixiang Wu[1], Laura Lavine[1], Doug Walsh[2] and Fang (Rose) Zhu[1], [1]Washington State Univ., Pullman, WA, [2]Washington State Univ., Prosser, WA

D3148 Verde plant bug: Competent vector of bacterial boll rotting pathogens. **James Glover** (jamesp.glover@ag.tamu.edu)[1], Mike Brewer[1], Gregory Sword[2] and Enrique Medrano[3], [1]Texas A&M Univ., Corpus Christi, TX, [2]Texas A&M Univ., College Station, TX, [3]USDA - ARS, College Station, TX

Grad Poster: SysEB, Coleoptera

Mile High Ballroom (Convention Center)

D3149 New records of mud-loving beetles (Coleoptera: Heteroceridae) in Mexico with ecological data. **L. Andrea Abela-Posada** (andrea.abela.p@gmail.com) and Atilano Contreras-Ramos, Univ. Nacional Autónoma de México, Mexico City, Mexico

D3150 A review of anthophily across Nitidulidae (Coleoptera: Cucujoidea). **Gareth Powell** (powellg@purdue.edu)[1], Andrew R. Cline[2] and Seth M. Bybee[3], [1]Purdue Univ., West Lafayette, IN, [2]California Dept. of Food and Agriculture, Sacramento, CA, [3]Brigham Young Univ., Provo, UT

D3151 Comparative phylogenetics and genome evolution of the global agricultural pest Colorado potato beetle, *Leptinotarsa decemlineata*. **Zachary Cohen** (zcohen3@wisc.edu)[1], Yolanda Chen[2] and Sean Schoville[1], [1]Univ. of Wisconsin, Madison, WI, [2]Univ. of Vermont, Burlington, VT

D3152 Evidence for an evolutionary arms race: Behavioral compensation for endosymbiotic sex-ratio manipulation. **Morgan Olmstead** (mlo1011@wildcats.unh.edu), Jeff Foster and Carrie Hall, Univ. of New Hampshire, Durham, NH

D3153 Multiple DNA loci for identification of southeast Asian ambrosia beetles (Coleoptera: Curculionidae: Scolytinae: Xyleborini). **Gina Sari** (sarigina@msu.edu)[1], Sarah M. Smith[1], You Li[2], Thai Pham[3], Wisut Sittichaya[4], Hisashi Kajimura[5], Sudhir Singh[6], Jiri Hulcr[2] and Anthony I. Cognato[1], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Florida, Gainesville, FL, [3]Vietnam National Museum of Nature, Hanoi, Vietnam, [4]Prince of Songkla Univ., Hat Yai, Thailand, [5]Nagoya Univ., Nagoya, Japan, [6]Forest Research Institute, Dehradun, India

D3154 Scrambling for the dead: Temporal niche partitioning in nicrophorine burying beetles. **Maranda Keller** (mlk1018@wildcats.unh.edu), Daniel Howard and Carrie Hall, Univ. of New Hampshire, Durham, NH

Grad Poster: SysEB, Diptera and Hemiptera

Mile High Ballroom (Convention Center)

D3155 Temporal and spatial patterns of *knockdown* resistance in *Aedes aegypti* in Iquitos, Peru. **Jennifer Baltzegar** (jen_baltzegar@ncsu.edu) and Fred Gould, North Carolina State Univ., Raleigh, NC

D3156 Bacterial communities in cochineal insect species of Arizona. **Jessica Vogt** (jrvogt@email.arizona.edu), Alison Ravenscraft and Martha Hunter, Univ. of Arizona, Tucson, AZ

D3157 Molecular evolution of gustation in *Ceratitis capitata*. **Sarah Giers** (sgiers2@illinois.edu), Univ. of Illinois, Champaign, IL

D3158 Texas populations of red-shouldered soapberry bug *Jadera haematoloma* tell a new evolutionary story. **Mattheau Comerford** (msc10@rice.edu)[1], Scott P. Carroll[2] and Scott Egan[1], [1]Rice Univ., Houston, TX, [2]Univ. of California, Davis, CA

D3159 A new species of *Rhagoletis* (Diptera: Tephritidae) in the *tabellaria* species group: Morphology, molecular phylogenetics, and host-plant use. **Daniel Hulbert** (hulbertd@msu.edu)[1], Morgan Jackson[2] and James Smith[1], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Guelph, Guelph, ON, Canada

D3160 The role of genetic variation in rapid adaptation of life history in host races of *Rhagoletis pomonella* (Diptera: Tephritidae). **McCall Calvert** (mccall.calvert@ucdenver.edu)[1], Edwina Dowle[1], Meredith Doellman[2], Peter Meyers[2], Daniel Hahn[3], Jeffrey Feder[2] and Gregory Ragland[1], [1]Univ. of Colorado, Denver, CO, [2]Univ. of Notre Dame, Notre Dame, IN, [3]Univ. of Florida, Gainesville, FL

D3161 A re-examination of the divergence dates of Reduvioidea (Heteroptera) in light of new fossil data. **Daniel Swanson** (drswanny@gmail.com)[1,2], Aron Katz[1], Sam W. Heads[1] and Steven Taylor[1], [1]Univ. of Illinois, Champaign, IL, [2]Illinois Natural History Survey, Champaign, IL

D3162 Investigating the evolutionary history of the pirate assassin bugs (Hemiptera: Reduviidae: Peiratinae). **Stephanie Castillo** (scast032@ucr.edu) and Christiane Weirauch, Univ. of California, Riverside, CA

Grad Poster: SysEB, Hymenoptera

Mile High Ballroom (Convention Center)

D3163 Queen pheromones mediating worker discrimination of queen supergene status in the red imported fire ant. **Haolin Zeng** (hz92146@uga.edu)[1], Laurent Keller[2], Jocelyn G. Millar[3] and Kenneth Ross[1], [1]Univ. of Georgia, Athens, GA, [2]Univ. de Lausanne, Lausanne, Switzerland, [3]Univ. of California, Riverside, CA

D3164 Effects of temperature on *Cardinium*-induced cytoplasmic incompatibility in a parasitoid. **Matthew Doremus** (mdoremus@email.arizona.edu), Suzanne E. Kelly and Martha Hunter, Univ. of Arizona, Tucson, AZ

D3165 Evaluation of bee hotels as an effective conservation tool for spring-emerging mason bees (genus *Osmia*) in the Commonwealth of Virginia. **Kathryn LeCroy** (kal8d@virginia.edu)[1] and T'ai Roulston[2], [1]Univ. of Virginia, Charlottesville, VA, [2]Univ. of Virginia, Boyce, VA

D3166 Presentation withdrawn

D3167 Origins of the social brain in the solitary alkali bee, *Nomia melanderi*. **Mallory Hagadorn** (mahagadorn@aggiemail.usu.edu), Makenna Johnson and Karen Kapheim, Utah State Univ., Logan, UT

D3168 Species delimitation and phylogeography of endemic Hawaiian parasitoid wasps: Genus *Spolas* (Hymenoptera: Ichneumonidae). **Natalie Graham** (n.graham@berkeley.edu)[1], Robert Peck[2] and Rosemary Gillespie[1], [1]Univ. of California, Berkeley, CA, [2]Univ. of Hawai'i, Hawai'i National Park, HI

D3169 Modelling land use change and climate effects on the sustainability of managed bee pollination services in the prairie pothole region. **Ning Li** (ning.li@und.edu)[1], Haochi Zheng[1] and Alisa Gallant[2], [1]Univ. of North Dakota, Grand Forks, ND, [2]U.S. Geological Survey, Sioux Falls, SD

D3170 Investigating forager behavior and movement patterns on trunk-trails of the carpenter ant *Camponotus rufipes*. **Natalie Imirzian** (nsi2@psu.edu) and David Hughes, Pennsylvania State Univ., University Park, PA

D3171 Stability of wild bee communities in successional landscapes. **Katherine Odanaka** (katherine.odanaka14@alumni.colostate.edu) and Sandra Rehan, Univ. of New Hampshire, Durham, NH

D3172 Integrating micro-CT into revisionary taxonomy to characterize invasive crazy ants of the genus *Nylanderia* (Hymenoptera: Formicidae). **Jason Williams** (jwilli81@ufl.edu) and Andrea Lucky, Univ. of Florida, Gainesville, FL

D3173 Drivers of wild bee biodiversity in New Hampshire: A historical perspective. **Minna Mathiasson** (minnamathiasson@gmail.com) and Sandra Rehan, Univ. of New Hampshire, Durham, NH

D3174 A root canal of miniscule proportions: Insights into phylogeny by wasp tooth morphology. **Robert Kresslein** (kressleinr@gmail.com)[1], Matthew Buffington[2] and John M. Heraty[1], [1]Univ. of California, Riverside, CA, [2]USDA - ARS, Washington, DC

Grad Poster: SysEB, Miscellaneous

Mile High Ballroom (Convention Center)

D3175 First approach toward diversity and biogeogrpahy of entomopathogenic nematodes in a large-unexplored province, Sitan and Balouchestan, Iran. **Fatemeh yeke Ghasemi** (adonis246028@gmail.com) and Javad Karimi, Ferdowsi Univ., Mashhad, Iran

D3176 Presentation withdrawn

D3177 Developmental plasticity hinders mate location in the presence of noise. **Gabrielle Gurule-Small** (g.gurulesmall@gmail.com) and Robin Tinghitella, Univ. of Denver, Denver, CO

D3178 Impact of bat predation and habitat structure on moth community composition. **Matthew Safford** (safford3@illinois.edu) and Steven Taylor, Univ. of Illinois, Champaign, IL

D3179 Taking out the trash: The first large-scale molecular phylogeny of the Amphipyrinae (Lepidoptera: Noctuidae). **Kevin Keegan** (kevin.keegan@uconn.edu)[1] and Niklas Wahlberg[2], [1]Univ. of Connecticut, Storrs, CT, [2]Lund Univ., Lund, Sweden

D3180 Diversity of *Brevipalpus* mites in south Texas from different citrus host plants. **Alejandra Fuentes** (alejandra.fuentes01@utrgv.edu)[1], W. Braswell[2] and Alexis Racelis[1], [1]Univ. of Texas, Edinburg, TX, [2]USDA - ARS, Edinburg, TX

D3181 Effects of advanced maternal age on offspring immunocompetency and fitness. **Claudia Hallagan** (claudia.hallagan@du.edu), Shannon Murphy and Robin Tinghitella, Univ. of Denver, Denver, CO

Undergrad Poster: MUVE and PBT

Mile High Ballroom (Convention Center)

D3182 Utilizing native pests as a source of renewable poultry feed. **Joshua Hogan** (jhogan12@knights.ucf.edu), Barbara Sharanowski and Joshua King, Univ. of Central Florida, Orlando, FL

D3183 Lab validation of a container oviposition sticky trap for collection of *Aedes aegypti* mosquitoes. **Phil Hutchinson** (phhutchi@millersville.edu), Kayli Thomas and John R. Wallace, Millersville Univ. of Pennsylvania, Millersville, PA

D3184 Microbiome of forensically important flies (Diptera) associated with human cadavers. **Derek Dane** (dwd008@shsu.edu), Keli King, Raymond Berry, Aaron Lynne and Sibyl Bucheli, Sam Houston State Univ., Huntsville, TX

D3185 Community succession of forensically important blow flies in Manhattan, New York. **Yoselin Paucar** (ypaucar06@yahoo.com), Jennifer Rosati and Hannah Chu, John Jay College of Criminal Justice, New York, NY

D3186 The bugs inside the bug: Uncovering potential symbionts of mosquitoes. **Jessica Skinner** (jskinner2@mail.usf.edu), Robert Nemitz, Ruby Ramos and Aparna Telang, Univ. of South Florida, Sarasota, FL

D3187 Correlation between *Drosophila melanogaster* toluene exposure and toxicity effects on fly survival and fecundity. **Vanessa Trivino** (trivinovanessa@gmail.com), Brenda Luu, Michael MacGregor, Angela Moreno, Brenda Nunez, Elmer Ledesma and Rosemarie Rosell, Univ. of St. Thomas, Houston, TX

D3188 Investigating the role of ferric reductases in *Drosophila melanogaster* cellular iron uptake. **Hannah Wagoner** (hwagoner@msudenver.edu)[1], Beah Benzel[1], Alma Ochoa[1], Maureen Gorman[2] and Emily Ragan[1], [1]Metropolitan State Univ., Denver, CO, [2]Kansas State Univ., Manhattan, KS

D3189 Characterizing thermal performance of an important pollinator, the alfalfa leafcutting bee *Megachile rotundata*. **Korie Debardlabon** (korie.debardlabon.1@ndsu.edu)[1], Meghan Bennett[1], Joseph P. Rinehart[2], George Yocum[2] and Kendra Greenlee[1], [1]North Dakota State Univ., Fargo, ND, [2]USDA - ARS, Fargo, ND

Undergrad Poster: P-IE, Apiculture, Behavior and Chemical Ecology

Mile High Ballroom (Convention Center)

D3190 *Nosema* spp. in feral *Apis mellifera* colonies from western Pennsylvania. **Alyssa Hatter** (amh6748@psu.edu)[1], Marla Stoner[1], Juliana Rangel[2], John Wenzel[3] and Brenna E. Traver[1], [1]Pennsylvania State Univ., Schuylkill Haven, PA, [2]Texas A&M Univ., College Station, TX, [3]Carnegie Museum of Natural History, Rector, PA

D3191 Predation risk mediates induced chemical defenses in Colorado potato beetle larvae. **Anthony Polyakov** (ap823@cornell.edu), Ari Grele, Arabelle Osicky, Zoe Getman-Pickering, Jennifer Thaler and Katja Poveda, Cornell Univ., Ithaca, NY

D3192 Modifications to Japanese beetle lures and trap designs to reduce attraction of native bees. **Sara Datson** (sara_datson@my.uri.edu), Steven Sipolski, Rebecca Gumbrewicz and Steven Alm, Univ. of Rhode Island, Kingston, RI

D3193 How genetic diversity impacts the chemical diversity of propolis foraging in the western honey bee, *Apis mellifera*. **Jamie Weagley** (jlweagley@fortlewis.edu), Aama Harwood, Alyssa Yocky, Steven Fenster and William Collins, Fort Lewis College, Durango, CO

D3194 Influence of host specificity on the dispersal propensity of *Callosobruchus maculatus*. **Paul Bergeron** (paul.bergeron@washburn.edu) and Rodrigo J. Mercader, Washburn Univ., Topeka, KS

D3195 Monitoring honey bee hive activity using infrared detectors and mayfly data logger. **Maggie Schappell** (maggiemay89@gmail.com), Jay Ham and Arathi Seshadri, Colorado State Univ., Fort Collins, CO

Undergrad Poster: P-IE, Ecology

Mile High Ballroom (Convention Center)

D3196 Exclosure experiment reveals comprehensive effects of bark and ambrosia beetles on fungal community assembly and reduced decay of forest biomass. **Paige Carlson** (pcarlson7@ufl.edu)[1], James Skelton[1], Katherine Smith[1], Michelle Jusino[2], Mark Banik[1], Daniel Lindner[2] and Jiri Hulcr[1], [1]Univ. of Florida, Gainesville, FL, [2]USDA - Forest Service, Madison, WI

D3197 The effects of jasmonic acid and mycorrhizal species on the nutrition, defense, and mycorrhizal colonization of *Solanum lycopersicum*. **Danielle Rutkowski** (dmr279@cornell.edu), Zoe Getman-Pickering and Jennifer Thaler, Cornell Univ., Ithaca, NY

D3198 Effect of growing field peas vs. fallow in a dryland crop rotation on the arthropod community. **Ethan Hoffart** (hoffartethan@gmail.com)[1], Strahinja Stepanovic[2] and Julie Peterson[3], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, Grant, NE, [3]Univ. of Nebraska, North Platte, NE

D3199 Invertebrate diversity in little fire ant, *Wasmannia auropunctata*, infested areas of Costa Rica and in the recently infested Micronesian island of Guam. **Lee Roy Sablan** (leeroyjr03@gmail.com)[1], Maia Raymundo[2] and Joyce Santos[1], [1]Univ. of Guam, Mangilao, Guam, [2]Univ. of Queensland, Brisbane, Australia

D3200 Effects of summer camps on preconceived notions of careers in STEM. **Kirsten Fetrow** (kjfetrow@me.com)[1], E. Broder[2], Shannon Murphy[2], Robin Tinghitella[2], Quyen Hart[3] and Jennifer Hoffman[2], [1]Univ. of Denver, Castle Rock, CO, [2]Univ. of Denver, Denver, CO, [3]Regis Univ., Denver, CO

D3201 Cover cropping for pollinators, beneficial insects in subtropical organic farms. **Diana Cantu** (diana.cantu01@utrgv.edu)[1], Quentin Van Camp[2], Alexis Racelis[1] and Pushpa Soti[1], [1]Univ. of Texas, Edinburg, TX, [2]Univ. Catholique de Louvain, Louvain-la-Neuve, Belgium

D3202 Response of partially resistant ash selections to aftermath levels of emerald ash borer (*Agrilus planipennis*) infestation. **Joseph Becker** (becker.542@osu.edu), The Ohio State Univ., Columbus, OH

D3203 Monarch butterfly (*Danaus plexippus*) oviposition and larval feeding preferences on five species of milkweed (*Asclepias* sp.) in northeast Iowa. **Shannon Meehan** (meehsh01@luther.edu), Elizabeth Glennon, Anna Holey, Brian Gerike, Laurie Adrian and Kirk Larsen, Luther College, Decorah, IA

D3204 Recent adult monarch butterfly (*Danaus plexippus*) abundance trends in tallgrass prairies of northeast Iowa. **Anna Holey** (holean01@luther.edu), Elizabeth Glennon, Shannon Meehan, Laurie Adrian, Brian Gerike and Kirk Larsen, Luther College, Decorah, IA

D3205 The potential for an outbreak of a native herbivore specialist insect following honeysuckle removal to lead to indirect effects on the insect herbivore community. **Logan Appenfeller** (logan.appenfeller@washburn.edu) and Rodrigo J. Mercader, Washburn Univ., Topeka, KS

D3206 Bee diversity and abundance in hemp (*Cannabis sativa* L.), a novel crop in Colorado. **Colton O'Brien** (coltobrien@gmail.com), Alison Hogeboom and Arathi Seshadri, Colorado State Univ., Fort Collins, CO

Undergrad Poster: P-IE, Miscellaneous

Mile High Ballroom (Convention Center)

D3207 Effect of initial queen count on colony success in fungus gardening ants, *Mycocepurus smithii*. **Peter Duong** (peter.duong37@yahoo.com), James Kurian and Chi-Chun Fang, Univ. of Texas, Austin, TX

D3208 Bringing the pollinators: What is the optimal native prairie plant mix to attract native bees? **Lauren Vahlkamp** (vahlkampl1@central.edu), Caitlyn Champ and Paulina Mena, Central College, Pella, IA

D3209 Determining the species composition of pollinators visiting South Dakota sunflower. **Mackenzie Mattern** (mackenzie.mattern@jacks.sdstate.edu)[1], Philip Rozeboom[1], Amanda Bachmann[2] and Adam Varenhorst[1], [1]South Dakota State Univ., Brookings, SD, [2]South Dakota State Univ., Pierre, SD

D3210 Quantification of the cypress looper (*Iridopsis* pergracilis) in the cypress swamp of the Arthur R. Marshall Loxahatchee National Wildlife Refugee located in southeast Florida 2017-2018. **Morgan McClure** (mmcclure@oapb.org), Oxbridge Academy, Lake Clarke Shores, FL

D3211 Presentation withdrawn

D3212 Neonicotinoid insecticide resistance in populations of the potato psyllid (*Bactericera cockerelli*) across Texas. **Kristyne Varela** (kristyne.varela@ag.tamu.edu)[1] and Ada Szczepaniec[2], [1]West Texas A&M Univ., Canyon, TX, [2]Texas A&M Univ., Amarillo, TX

D3213 Effect of photoperiod on sugarcane aphid, *Melanaphis sacchari*, on sorghum. **Ethan Triplett** (ethan.l.triplett@gmail.com) and Bonnie Pendleton, West Texas A&M Univ., Canyon, TX

Undergrad Poster: SysEB, Coleoptera

Mile High Ballroom (Convention Center)

D3214 Documentation of new species of the bizarre South African endemic genus *Meziomorphum* (Coleoptera: Ptinidae). **Olivia Gearner** (olivia.gearner529@topper.wku.edu) and T. Keith Philips, Western Kentucky Univ., Bowling Green, KY

D3215 Description of the last larval instar of *Ellychnia corrusca* (Linnaeus, 1767) (Coleoptera: Lampyridae). **Evan Waite** (waitesevan@gmail.com)[1], Oliver Keller[1], Riley Risteen[2], Kathareeya Tonyai[2], Scott R. Smedley[2] and Marc Branham[1], [1]Univ. of Florida, Gainesville, FL, [2]Trinity College, Hartford, CT

D3216 Morphological description of *Capnodis* spp. in the southern region of Syria. **Shadi Akeel** (shadi78136@hotmail.com), Damascus Univ., Al-Sweida, Syria

D3217 Evaluation of the efficiency of some insecticides for the control of Capnodis insect, *Capnodis tenebrionis* L. **Wajih Alkassis** (faredinstitute@hotmail.com), Damascus Univ., Al-Sweida, Syria

D3218 Habitat fragmentation and trophic guild affect beetle species' stable isotope values. **Manuela Mejia** (manuela.mejia@colorado.edu), Michaela Trainer, Rachel Rigden, Kendi Davies, Julian Resasco and Andrew Hicks, Univ. of Colorado, Boulder, CO

D3219 Phylogenetic reconstruction of North American *Xyleborini* species. **Lidia Komondy** (lkomondy@msu.edu) and Anthony I. Cognato, Michigan State Univ., East Lansing, MI

D3220 The beetle bandit: The utilization of biosurveillance to monitor the spread of the emerald ash borer. **Dorianna Dobson** (dorianna.dobson@bobcats.gcsu.edu), Payton Burriss, Caroline Fowler and Nathan Lord, Georgia College, Milledgeville, GA

D3221 Co-evolution in divergent insects: *Cerceris fumipennis* and Buprestidae. **Caroline Fowler** (caroline.fowler@bobcats.gcsu.edu), Dorianna Dobson, Payton Burriss and Nathan Lord, Georgia College, Milledgeville, GA

Undergrad Poster: SysEB, Miscellaneous

Mile High Ballroom (Convention Center)

D3222 A five-year survey of mosquito populations in Brown County, South Dakota, USA, and implications for West Nile virus. Elizabeth N. Katz, **Stephanie M. Anderson** (stephanie.m.anderson@wolves.northern.edu), Cindy S. Venegas, Tanner A. Peltier, John S. Miller, Mina Jeong, Zachary Fleming, Madilyn J. Bommersbach and Jon Mitchell, Northern State Univ., Aberdeen, SD

D3223 Evaluating insecticidal resistance of mosquito populations in Brown County, South Dakota – A three year survey. Elizabeth N. Katz, Stephanie M. Anderson, **Cindy S. Venegas** (cindy.venegas@wolves.northern.edu), Tanner A. Peltier, John S. Miller, Mina Jeong, Zachary Fleming, Madilyn J. Bommersbach and Jon Mitchell, Northern State Univ., Aberdeen, SD

D3224 The phylogeny of Macromiidae, inferred by molecular and morphological data. **Ken Knapp** (kbk46@scarletmail.rutgers.edu) and Jessica Ware, Rutgers, The State Univ. of New Jersey, Newark, NJ

D3225 Presentation withdrawn

D3226 The characterization of louse fly microbiomes on migrating raptors: Implications for avian pathogen dispersal. **Kayli Thomas** (klthoma3@millersville.edu)[1], Rebecca McCabe[2], Joseph Receveur[3], M. Eric Benbow[3], Jennifer Pechal[3] and John R. Wallace[1], [1]Millersville Univ. of Pennsylvania, Millersville, PA, [2]Acopian Center for Conservation Learning at Hawk Mountain Sanctuary, Orwigsburg, PA, [3]Michigan State Univ., East Lansing, MI

D3227 The impact of management practice on insect community structure and diversity in tallgrass prairies. **Beth Ann Hansen** (hansenbe@grinnell.edu), Caitlyn Mohr, Meghan Riley and Susan Villarreal, Grinnell College, Grinnell, IA

D3228 Color diversification in Odonata. Yelena M. Pacheco[1], **Mitchell T. Young** (mitchelltyoung@gmail.com)[1], Joseph K. Warren[1], Mary M. Layne[1], Lindsey T. Marx[1], Anton Suvorov[1], Julien P. Renoult[2], James Dale[3] and Seth M. Bybee[1], [1]Brigham Young Univ., Provo, UT, [2]Chargé de Recherche, Montpellier, France, [3]Massey Univ., Auckland, New Zealand

D3229 Evaluation of the diet breadth of *Odontomachus bauri* on the island of Dominica. **Samuel Shook** (srshook@tamu.edu), James Woolley, Adrienne Brundage and Thomas Lacher, Texas A&M Univ., College Station, TX

D3230 Experimental habitat fragmentation does not reduce the trophic position of the generalist predator, the funnel-web spider, *Atrax sutherlandi*. **Rachel Rigden** (rachel.rigden@colorado.edu), Julian Resasco, Andrew Hicks and Kendi Davies, Univ. of Colorado, Boulder, CO

D3231 Cold tolerance: Examination of types and taxon distribution of antifreeze proteins in hexapods. **Prabhjot Grewal** (pkg2110@columbia.edu)[1] and Steve Davis[2], [1]Columbia Univ., New York, NY, [2]American Museum of Natural History, New York, NY

D3232 Giant among dwarfs: *Meganannus lewisi*, gen.n. and sp.n., a new genus and species of minute litter bugs from Costa Rica (Hemiptera: Schizopteridae). **Kyle Whorrall** (kwhor001@ucr.edu), Alexander Knyshov, Rochelle Hoey-Chamberlain and Christiane Weirauch, Univ. of California, Riverside, CA

D3233 Identification of females of *Agapostemon texanus* and *Agapostemon angelicus* based on wing morphometric analysis. **Bryan Guevara** (bryan.guevara@est.zamorano.edu)[1], Torie Whisenant[2], Samuel Discua[2] and Scott Longing[2], [1]Zamorano Univ., Tegucigalpa, Honduras, [2]Texas Tech Univ., Lubbock, TX

D3234 Historical changes in distribution and floral associations of bumble bee (Apidae: *Bombus*) species of greatest conservation need in New Hampshire. **Molly Jacobson** (mmg226@wildcats.unh.edu) and Sandra Rehan, Univ. of New Hampshire, Durham, NH

D3235 Population structure of *Nasutitermes* in Karanambu, Guyana. **Catalina Guzman** (csg397@live.com), Rutgers, The State Univ. of New Jersey, Clifton, NJ

Grad Virtual Poster: MUVE

Mile High Ballroom (Convention Center)

VP03 Investigation of the extraction techniques for the identification of fly larvae using GC-MS to enhance current forensic entomology practice. **Elizabeth Deakin** (e.m.deakin@staffs.ac.uk), Claire Gwinnett and David Skingsley, Staffordshire Univ., Stoke-on-Trent, United Kingdom

VP04 Ecology of ticks and tick-borne pathogens in a peri-urban landscape of the midwestern U.S. **Abrar Alzahrani** (alzaharani@pittstate.edu) and Anuradha Ghosh, Pittsburg State Univ., Pittsburg, KS

VP05 A multi-dimensional approach to house fly control. **Dana Johnson** (dana.johnson@ars.usda.gov)[1,2], Christopher Geden[2], Emma Weeks[1] and Eric LoVullo[2], [1]Univ. of Florida, Gainesville, FL, [2]USDA - ARS, Gainesville, FL

VP06 Using a genome wide association study to highlight putative resistance specific variants to dengue in *Aedes aegypti*. **Heather Coatsworth** (hcoatswo@sfu.ca) and Carl Lowenberger, Simon Fraser Univ., Burnaby, BC, Canada

VP07 Evaluation of pyriproxyfen applied in truck-mounted barrier sprays for mosquito suppression. **A. Glenn Skiles** (glennskiles@gmail.com)[1], Grayson Brown[1] and Nicola T. Gallagher[2], [1]Univ. of Kentucky, Lexington, KY, [2]Syngenta, Greensboro, NC

VP08 Determining the lethal concentrations of permethrin for a laboratory reared colony of *Culicoides sonorensis* (Diptera: Ceratopogonidae). **Laura Harmon** (larharmon@ufl.edu)[1], Emma N. I. Weeks[1], Katherine Sayler[1], Nathan Burkett-Cadena[2] and Elin Maki[3], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Florida, Vero Beach, FL, [3]USDA - ARS, Manhattan, KS

Grad Virtual Poster: P-IE

Mile High Ballroom (Convention Center)

VP09 Effect of genetically modified Bt corn over non-target predators at Sinaloa, Mexico. **Luis Aguirre** (luisaguirreu@yahoo.com.mx), Agustín Hernández-Juárez, Aideé González-Ruíz, Mariano Flores, Ernesto Cerna, Gustavo Frías, Jerónimo Landeros and Yisa Ochoa, Univ. Autónoma Agraria Antonio Narro, Saltillo, Mexico

VP10 Pirate bug *Orius insidiosus* (Hemiptera: Anthocoridae) abundance in genetically modified and conventional corn. **Agustín Hernández-Juárez** (chinoahj14@hotmail.com), Luis Aguirre, Aideé González-Ruíz, Ernesto Cerna, Mariano Flores, Gustavo Frías, Yisa Ochoa and Jerónimo Landeros, Univ. Autónoma Agraria Antonio Narro, Saltillo, Mexico

VP11 Defense allocation upon multiple stresses: Impacts of drought stress on performance of caterpillars and induced defense responses in tomato. **Po-An Lin** (pbl5066@psu.edu), Sulav Paudel, Amin Afzal, Nancy Shedd and Gary Felton, Pennsylvania State Univ., University Park, PA

VP12 Molecular detection of parasites and pathogens in hobbyist Arkansas honey bee (*Apis mellifera L.*) colonies. **Dylan Cleary** (dacleary@uark.edu) and Allen Szalanski, Univ. of Arkansas, Fayetteville, AR

VP13 Munching on mayflies: The effect of invertebrate carcass deposition on insect contributions to nutrient cycling in an agricultural system. **Audrey Maran** (amaran@bgsu.edu) and Shannon Pelini, Bowling Green State Univ., Bowling Green, OH

VP14 Characterization of the nature of Rag5-mediated resistance to soybean aphids. **Kumud Joshi** (joshk01@ipfw.edu) and Vamsi Nalam, Indiana Univ.-Purdue Univ., Fort Wayne, IN

VP15 Seasonal movement and exclusion of spotted-wing drosophila. **Lizabeth Herrera** (lrherrer@email.uark.edu), Donn Johnson and Rosalee Knipp, Univ. of Arkansas, Fayetteville, AR

VP16 Relationship between abdomen color and weight at emergence of Africanized honeybee queens (*Apis mellifera* L.). **Pedro Santos** (peter.zootecnia@gmail.com), Alessandra Gonçalves, Tuan Souza, Claudio Silva Junior and Vagner Toledo, State Univ. of Maringa, Maringá, Brazil

VP17 Evaluating major sources of iris yellow spot virus in New York. **Ashley Leach** (al2282@cornell.edu)[1], Marc Fuchs[1], Riley Harding[1], Rebecca Schmidt-Jeffris[2] and Brian A. Nault[1], [1]Cornell Univ., Geneva, NY, [2]Clemson Univ., Charleston, SC

VP18 Filling in the gaps of the IMD immune pathway of the kissing bug *Rhodnius prolixus*. **Nicolas Salcedo-Porras** (nsalcedo@sfu.ca)[1], Alessandra Guarneri[2] and Carl Lowenberger[1], [1]Simon Fraser Univ., Burnaby, BC, Canada, [2]Fundação Oswaldo Cruz, Belo Horizonte, Brazil

Grad Virtual Poster: SysEB

Mile High Ballroom (Convention Center)

VP19 How to be a successful invader: Lessons from the life cycle of an Antarctic midge. **Jesamine Bartlett** (jcb553@bham.ac.uk)[1,2], Pete Convey[2] and Scott Hayward[1], [1]Univ. of Birmingham, Birmingham, United Kingdom, [2]British Antarctic Survey, Cambridge, United Kingdom

VP20 Operational sex ratio and paternal age sway mating and reproductive performance in *Menochilus sexmaculatus*. **Swati Saxena** (swati90lko@gmail.com)[1], Geetanjali Mishra[2] and Prof. Omkar[1], [1]Univ. of Lucknow, Lucknow, India, [2]Ladybird Research Laboratory, Lucknow, India

VP21 Plasticity of reproductive output and development in response to thermal variation in ladybird, *Menochilus sexmaculatus*. **Shashwat Singh** (shashwatnaman@gmail.com), Geetanjali Mishra and Omkar Omkar, Univ. of Lucknow, Lucknow, India

VP22 Effect of body size and familiarity on mate guarding in *Menochilus sexmaculatus* (Fabricius) (Coleoptera: Coccinellidae). **Priya Singh** (priyariea@gmail.com), Geetanjali Mishra and Omkar Omkar, Univ. of Lucknow, Lucknow, India

VP23 Leg impairment induces behavioural plasticity in *Menochilus sexmaculatus*. **Apoorva Shandilya** (shandilya.apoorva.17@gmail.com), Geetanjali Mishra and Omkar Omkar, Univ. of Lucknow, Lucknow, India

VP24 Body size influences clutch size in an aphidophagous ladybird beetle *Coelophora saucia* (Mulsant). **Shuchi Tripathi** (shuchi.dev@gmail.com) and Omkar Omkar, Univ. of Lucknow, Lucknow, India

VP25 Phylogenetics of coccinellids using molecular marker ITS1. **Chandni Verma** (chandni07v@gmail.com), Geetanjali Mishra and Omkar Omkar, Univ. of Lucknow, Lucknow, India

VP26 Can host nutrition modulate disease outcome in mixed pathogen infection? **Pauline Deschodt** (pdeschod@sfu.ca), Olivia Walker, Alana Breitkreutz and Jenny Cory, Simon Fraser Univ., Burnaby, BC, Canada

VP27 Effects of wildland fire on ant communities in the Valles Caldera National Preserve. **Jonathan Knudsen** (jonathan.a.knudsen@ttu.edu)[1], Robert R. Parmenter[2] and Robin M. Verble-Pearson[1], [1]Texas Tech Univ., Lubbock, TX, [2]Valles Caldera Trust, Jemez Springs, NM

Undergrad Virtual Poster: MUVE, P-IE, and SysEB

Mile High Ballroom (Convention Center)

VP28 The role of egg parasitoids in the biological control of lepidopteran-pests in soybean fields in southwest Brazil. **Douglas Batista Filho** (douglasbatista.agro@gmail.com)[1], Flávio Amaral[1], Thiago Tristão[1], Antonio Busoli[2] and Diego Fraga[1], [1]Faculdades Associadas de Uberaba, Uberaba, Brazil, [2]Univ. Estadual Paulista, Jaboticabal, Brazil

VP29 The behavioral compatibility of long-lasting insecticide netting for prevention of infestation by *Tribolium castaneum* in the laboratory. **Rachel Wilkins** (rachwilk15@gmail.com)[1] and Rob Morrison[2], [1]Kansas State Univ., Manhattan, KS, [2]USDA - ARS, Manhattan, KS

VP30 Behavioral response of *Tribolium castaneum* to volatiles from dried distillers grains and other odor blends in the laboratory and pilot scale warehouses. **Matt Hamblin** (mkhamblin@ksu.edu)[1], James Campbell[2] and Rob Morrison[2], [1]Kansas State Univ., Manhattan, KS, [2]USDA - ARS, Manhattan, KS

VP31 Exposure and behavioral assays of four OMRI approved insecticides on the biocontrol generalist predator, green lacewing, *Chrysoperla rufilabris*. **Harlee Pauley** (hpauley7@wvstateu.edu), Jackie Fletcher, Daniel Payne, Hannah Payne and Barbara Liedl, West Virginia State Univ., Institute, WV

VP32 Towards optimization of pre-slaughter feed withdrawal for black soldier fly larvae (*Hermetia illucens*). **Jennifer Larouche** (jennifer.larouche.1@ulaval.ca), Marie-Hélène Deschamps, Linda Saucier and Grant Vandenberg, Univ. Laval, Québec, QC, Canada

VP33 A new record and a new synonym of *Callyntrotus schlechtendalii* Nalepa for the State of Maryland. **Jenny Bo** (hjennybo@gmail.com), Ronald Ochoa, Gary R. Bauchan and Andrew Ulsamer, USDA - ARS, Beltsville, MD

VP34 Curation and data management of the largest cryopreserved bark beetle collection. **Katherine Arguez** (arguez.katherine@gmail.com) and Jiri Hulcr, Univ. of Florida, Gainesville, FL

VP35 Gastral drumming in *Vespula germanica*: Additional roles in colony organization. **Khasan Kuliev** (khkuliev@lagcc.cuny.edu), Khusen Kuliev, Md. Shah and Benjamin J. Taylor, LaGuardia Community College, Long Island City, NY

VP36 Diversity of Braconidae in Acadia National Park. **Kendall King** (kendallaking@aol.com)[1] and Robert R. Kula[2], [1]Smithsonian Institution, Washington, DC, [2]USDA - ARS, Washington, DC

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HIGHLIGHTED POSTERS & VIRTUAL POSTERS

Highlighted Posters and Virtual Posters displayed throughout the week will be the same as those listed on Sunday, D3000-D3007 and VP01-VP02. See page 134 for titles and authors.

Monday, November 6, 2017 • MORNING

Sunrise Session: Women in Entomology Breakfast

Altitude II (Hyatt Regency)

Moderators and Organizers: Gail Kampmeier[1], Elizabeth F. Beckemeyer[2], Rayda K. Krell[3], Patricia Prasifka[4], Amanda Jacobson[5] and Michelle Smith[5], [1]Illinois Natural History Survey, Champaign, IL, [2]Georgia Perimeter College, Covington, GA, [3]Western Connecticut State Univ., Danbury, CT, [4]Dow AgroSciences, West Fargo, ND, [5]Dow AgroSciences, Indianapolis, IN

6:30 AM - 7:45 AM

Grad Lightning Bug (3-min): All Sections, Session 1

Four Seasons Ballroom (Convention Center)

Moderator and Organizer: Adam Varenhorst, South Dakota State Univ., Brookings, SD

Due to the rapid speed of delivery, specific times are not listed for individual talks in this section. Each talk will be limited to a total of 3 minutes; talks will be given in sequential order as listed below starting at 8:00 AM with no pauses for no-show presenters.

8:00 AM – 9:00 AM

0482 Interactions between emerald ash borer, woodpeckers, and *Spathius galinae* in Virginia. **Max Ragozzino** (maxri@vt.edu)[1], Scott Salom[1] and Jian Duan[2], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]USDA - ARS, Newark, DE

0483 Mechanisms of the possible host shift of *Teleonemia scrupulosa* between *Lantana camara* and *Myoporum sandwicense* var. *stellatum*. **Dominique R. Zarders** (dreg@hawaii.edu)[1], Jesse A. Eiben[1] and Tracy Johnson[2], [1]Univ. of Hawai'i, Hilo, HI, [2]USDA - Forest Service, Volcano, HI

0484 Identification of pheromones of the potentially invasive beetles *Callidiellum villosulum* and *Allotraeus asiaticus*. **Devin A. Kreitman** (dkreitmannyc@gmail.com)[1], Jacob D. Wickham[1,2], Wen Lu[3], Zishu Dong[3], Yunfan Zou[4], Yi Chen[2], Lawrence M. Hanks[5] and Jocelyn G. Millar[4], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Chinese Academy of Sciences, Beijing, China, [3]Guangxi Univ., Nanning, China, [4]Univ. of California, Riverside, CA, [5]Univ. of Illinois, Champaign, IL

0485 Landscape effects on the spatial distribution of *Drosophila suzukii* in blueberries. **Caryn Michel** (cam530@scarletmail.rutgers.edu), Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

0486 Detecting sugarcane aphid (*Melanaphis sacchari*) infestation in grain sorghum (*Sorghum bicolor*) using spectral signature. **Grace Craigie** (craigieg@ksu.edu)[1], Brian McCornack[2], Ignacio Ciampitti[1] and Douglas Goodin[1], [1]Kansas State Univ., Manhattan, KS, [2]Plant Biosecurity Cooperative Research Centre, Bruce, Australia

0487 Associated tolerance traits to root injury in rice. **James Michael Villegas** (jamesvillegas12@gmail.com) and Michael Stout, Louisiana State Univ., Baton Rouge, LA

0488 Pesticide free sorghum: Battle with aphid. **Sulochana Paudyal** (sulochana.paudyal@okstate.edu)[1], J. Scott Armstrong[2] and Kris Giles[1], [1]Oklahoma State Univ., Stillwater, OK, [2]USDA - ARS, Stillwater, OK

0489 Unraveling plant-insect interactions using rice mutant lines. **Lina Bernaola** (lbernaola@agcenter.lsu.edu) and Michael Stout, Louisiana State Univ., Baton Rouge, LA

0490 Plant-mediated phytoplasma-vector interaction in American cranberry. **Nakorn Pradit** (nakorn.pradit@rutgers.edu) and Cesar Rodriguez-Saona, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

0491 The effect of methyl jasmonate seed treatments on plant growth of rice, *Oryza sativa*, and subsequent population density of *Lissorhoptrus oryzophilus*. **Emily Kraus** (ekraus@agcenter.lsu.edu) and Michael Stout, Louisiana State Univ., Baton Rouge, LA

0492 Use of long term endectocide in cattle for control of the malaria mosquito, *Anopheles quadrimaculatus*. **Annie Rich** (aerich@uga.edu)[1], Nancy C. Hinkle[1] and Seth Irish[2], [1]Univ. of Georgia, Athens, GA, [2]Centers for Disease Control and Prevention, Atlanta, GA

0493 Insects feeding insects: An insect-based artificial diet to rear *Aedes* mosquitoes. **Johanna Ohm** (jro182@psu.edu) and Matthew Thomas, Pennsylvania State Univ., University Park, PA

0494 Effect of different routes of exposure on toxicity of novaluron and diflubenzuron to *Drosophila suzukii* (Diptera: Drosophilidae). **Alix Whitener** (alix.crilly@wsu.edu) and Elizabeth H. Beers, Washington State Univ., Wenatchee, WA

0495 Presentation withdrawn

0496 Effects of heat on competitiveness and resistance to natural enemies in *Rhagoletis pomonella*. **Sarah Giers** (sgiers2@illinois.edu), Univ. of Illinois, Champaign, IL

0497 Comparative phylogenetics and genome evolution of the global agricultural pest Colorado potato beetle, *Leptinotarsa decemlineata*. **Zachary Cohen** (zcohen3@wisc.edu)[1], Yolanda Chen[2] and Sean Schoville[1], [1]Univ. of Wisconsin, Madison, WI, [2]Univ. of Vermont, Burlington, VT

0498 Presentation withdrawn

0499 Presentation withdrawn

0500 The effects of alternative golf course habitats on biological control of herbivorous pests. **Rebecca Perry** (rlperry93@gmail.com) and Adam Dale, Univ. of Florida, Gainesville, FL

Grad 10-min: MUVE, Termites and Urban Insects

Meeting Room 302 (Convention Center)

Moderator: Dong-Hwan Choe, Univ. of California, Riverside, CA

8:00 **0501** Seasonality of salt foraging in honey bees (*Apis mellifera*). **Rachael Bonoan** (rachael.bonoan@tufts.edu), Tufts Univ., Medford, MA

8:10 **0502** The effects of soilborne pathogens on the colony breeding structure of the eastern subterranean termite, *Reticulitermes flavipes*. **Carlos Aguero** (cague001@tamu.edu)[1], Jason Martin[2], Mark S. Bulmer[2] and Edward Vargo[1], [1]Texas A&M Univ., College Station, TX, [2]Towson Univ., Towson, MD

8:20 **0503** A comparison of movement activity among two *Coptotermes* species and their hybrids. **Sang-Bin Lee** (lsb5162@ufl.edu), Thomas Chouvenc and Nan-Yao Su, Univ. of Florida, Davie, FL

8:30 **0504** Phoresy and within-colony transmission of nematodes associated with alates of subterranean termites (Isoptera: Rhinotermitidae). **Jeremiah Foley** (folejr@vt.edu)[1], Thomas Chouvenc[2], Robin Giblin-Davis[2] and Nan-Yao Su[2], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Univ. of Florida, Davie, FL

8:40 **0505** Evaluation of the 20-hydroxyecdysone deterrence threshold for *C. formosanus*, *C. gestroi*, and *R. flavipes* with comparison to noviflumuron. **Lucas Carnohan** (carnohanl@ufl.edu)[1], Nan-Yao Su[1] and Salvador Gezan[2], [1]Univ. of Florida, Davie, FL, [2]Univ. of Florida, Gainesville, FL

8:50 **0506** Molecular ecological characterization of trypanosomatid parasites infecting honey bees. **Qiushi Liu** (qiushi.liu@xjtlu.edu.cn)[1,2], Stuart Armstrong[2], Alistair Darby[2] and Tatsuhiko Kadowaki[1], [1]Xi'an Jiaotong Univ., Suzhou, China, [2]Univ. of Liverpool, Liverpool, United Kingdom

9:00 **0507** Identification of protozoa in *Coptotermes gestroi* (Wasmann) (Blattodea: Rhinotermitidae) and quantitative changes in protozoan density within kings and queens during colony development. **Joseph Velenovsky** (jvelen10@ufl.edu)[1], Thomas Chouvenc[1], Gillian Gile[2] and Nan-Yao Su[1], [1]Univ. of Florida, Davie, FL, [2]Arizona State Univ., Tempe, AZ

Grad 10-min: MUVE, Ticks and Urban Pests

Meeting Room 303 (Convention Center)

Moderators: Nancy C. Hinkle[1] and Brandon Smythe[2], [1]Univ. of Georgia, Athens, GA, [2]New Mexico State Univ., Las Cruces, NM

8:00 **0508** Integrated *Ixodes scapularis* tick management through combination of landscape manupulation and host-targeted acaracides. **Jordan Mandli** (mandli@wisc.edu), Univ. of Wisconsin, Madison, WI

8:10 **0509** The dung diaries: How different beetle groups affect dung-mediated greenhouse gas production. **Fallon Fowler** (fefowler@ncsu.edu), Steve Denning, Shuijin Hu and Wes Watson, North Carolina State Univ., Raleigh, NC

8:20 **0510** Presentation withdrawn

8:30 **0511** The effect of temperature and insect population size on the rate of oxygen consumption by a postharvest pest: Cowpea bruchid (*Callosobruchus maculatus* Fabricius) during hermetic storage. **Hannah Quellhorst** (hquellho@purdue.edu) and Dieudonne Baributsa, Purdue Univ., West Lafayette, IN

8:40 **0512** Locomotion inhibition of *Cimex lectularius* L. following topical application of lufenuron. **Brittany Campbell** (bedelong@ufl.edu) and Philip G. Koehler, Univ. of Florida, Gainesville, FL

8:50 **0513** RNA interference of *vacuolar ATPase* reduces reproductive fitness and lifespan in bed bugs. **Sanjay Basnet** (sbasnet2@unl.edu) and Shripat Kamble, Univ. of Nebraska, Lincoln, NE

9:00 **0514** Exploring bed bug (*Cimex lectularius*) tolerance to heat exposure based on treatment history, insecticide resistance profile, and geographic origin. **Aaron Ashbrook** (aashbroo@purdue.edu), Michael Scharf, Gary Bennett and Ameya Gondhalekar, Purdue Univ., West Lafayette, IN

9:10 **0515** A survey of Mississippi mosquitoes' blood meals and malaria parasites. **Jessica Aycock** (jla363@msstate.edu), Jerome Goddard and Diana Outlaw, Mississippi State Univ., Mississippi State, MS

9:20 **0516** The mystery of the immature stages of *Ixodes scapularis* in the south: Where are they? **Mackenzie Tietjen** (kenzietietjen@tamu.edu)[1], Ivan Castro-Arellano[2], Maria Esteve-Gassent[1] and Raul F. Medina[1], [1]Texas A&M Univ., College Station, TX, [2]Texas State Univ., San Marcos, TX

Grad 10-min: PBT, Toxicology

Meeting Room 301 (Convention Center)

Moderators: Daniel Swale[1] and Dariane Souza[2], [1]Vanderbilt Univ., Nashville, TN, [2]Univ. of Nebraska, Lincoln, NE

8:00 **0517** Influence of prophylactic insecticide use on decomposer communities in maize and soybean fields. **Kirsten Pearsons** (kfp5094@psu.edu) and John Tooker, Pennsylvania State Univ., University Park, PA

8:10 **0518** Differential transcriptomic profiles of diamondback moth larvae treated with sublethal doses of five different insecticides. **Yue Gao** (gyloveasd@gmail.com), Kyungmun Kim, Deok Ho Kwon and Si Hyeock Lee, Seoul National Univ., Seoul, South Korea

8:20 **0519** Accumulation of dsRNA in endosomes contributes to inefficient RNA interference in lepidopteran insects. **June-Sun Yoon** (june.yoon@uky.edu) and Subba Reddy Palli, Univ. of Kentucky, Lexington, KY

8:30 **0520** Macronutrient regulation of *Helicoverpa armigera* in Bt cotton: Does nutritional intake alter the susceptibility of insects to Bt proteins? **Ashley Tessnow** (atessnow@tamu.edu)[1], Spencer T. Behmer[1], Tom Walsh[2] and Gregory Sword[1], [1]Texas A&M Univ., College Station, TX, [2]CSIRO, Acton, Australia

8:40 **0521** The metabolism and excretion of nicotine in the cabbage looper, *Trichoplusia ni* (Hübner). **Brett Saremba** (brettsaremba@gmail.com) and Mark Rheault, Univ. of British Columbia, Kelowna, BC, Canada

8:50 **0522** Salivary gland transcriptome of *Cimex lectularius* and functional assessment of select salivary components. **Travis van Warmerdam** (tcv34@msstate.edu), Austin Drury, Jerome Goddard and Jonas G. King, Mississippi State Univ., Mississippi State, MS

9:00 **0523** Differential expression of acetycholinesterase 1 in response to various stress factors in honey bee workers. **Sang Hyeon Kim** (zlddh97@snu.ac.kr), Kyungmun Kim, Jae Ho Lee, Seung Hee Han and Si-Hyeock Lee, Seoul National Univ., Seoul, South Korea

9:10 **0524** Effect of a neonicotinoid on the mating behavior of the biological control agent *Spalangia endius*. **Aspen Kremer** (akremer1@niu.edu) and Bethia H. King, Northern Illinois Univ., DeKalb, IL

Grad 10-min: P-IE, Apiculture

Meeting Room 503 (Convention Center)

Moderator: Paul Borth, Ento-Centric Consulting, Zionsville, IN

8:00 **0525** The sentinel apiary program: Collaborating with beekeepers to improve honey bee colony health and management. **Kelly Kulhanek** (kkulhane@umd.edu) and Dennis vanEngelsdorp, Univ. of Maryland, College Park, MD

8:10 **0526** Ten years of honey bee colony loss survey: Trends and insights. **Nathalie Steinhauer** (nathalie.steinhauer@gmail.com) and Dennis vanEngelsdorp, Univ. of Maryland, College Park, MD

8:20 **0527** Determining the minimum number of pollen grains needed for accurate honey bee (*Apis mellifera*) colony pollen pellet analysis. **Pierre Lau** (plau0168@tamu.edu), Vaughn Bryant and Juliana Rangel, Texas A&M Univ., College Station, TX

8:30 **0528** Self-awareness in honey bees (*Apis mellifera*) and mechanisms of grooming behaviour. **Derek Micholson** (derek.micholson@gmail.com) and Rob Currie, Univ. of Manitoba, Winnipeg, MB, Canada

8:40 **0529** Impact of dietary phytochemical, neonicotinoid, and acaricide interactions on honey bee (*Apis mellifera*) survival. **Michael Wong** (mjwong2@illinois.edu) and May Berenbaum, Univ. of Illinois, Champaign, IL

8:50 **0530** Influence of cultural practices on soybean nectar production. **Ty Smith** (tms377@msstate.edu)[1], Angus Catchot[1], Jeffrey Harris[2], Jeff Gore[3], Natraj Krishnan[1] and Don Cook[3], [1]Mississippi State Univ., Mississippi State, MS, [2]USDA - ARS, Baton Rouge, LA, [3]Mississippi State Univ., Stoneville, MS

Grad 10-min: P-IE, Biological Control, Predators

Meeting Room 501 (Convention Center)

Moderator: Paula M. Shrewsbury, Univ. of Maryland, College Park, MD

8:00 **0531** Effect of land-use intensity on aphid natural enemies in Paysandú, Uruguay. **Sara Emery** (semery@berkeley.edu)[1], Mattias Jonsson[2], Adela Ribeiro[3] and Nicholas Mills[1], [1]Univ. of California, Berkeley, CA, [2]Swedish Univ. of Agricultural Sciences, Uppsala, Sweden, [3]Univ. de la República, Paysandú, Uruguay

8:10 **0532** Cover cropping in cotton agroecosystems: Implications for pest management and production. **Carson Bowers** (carson.bowers@uga.edu), Jason Schmidt and Michael Toews, Univ. of Georgia, Tifton, GA

8:20 **0533** Assessing the impact of predatory beetle, *Laricobius nigrinus* (Coleoptera: Derodontidae), on hemlock woolly adelgid (Hemiptera: Adelgidae) in the eastern U.S. **Carrie S. Jubb** (cjubb@vt.edu)[1], Albert Mayfield[2], Gregory J. Wiggins[3], Jerome F. Grant[3], Joseph Elkinton[4], Thomas McAvoy[1], Jeff Lombardo[5], Bryan Mudder[2] and Scott Salom[1], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]USDA - Forest Service, Asheville, NC, [3]Univ. of Tennessee, Knoxville, TN, [4]Univ. of Massachusetts, Amherst, MA, [5]Dartmouth College, Hanover, NH

8:30 **0534** Arthropod response to organic cover crop-based reduced-tillage cropping systems. **Karly Regan** (kjr5470@psu.edu), Christina Mullen and Mary Barbercheck, Pennsylvania State Univ., University Park, PA

8:40 **0535** Vegetational diversity and biological control on organic brassica farms in the Federal District, Brazil. **Hannah Gray** (grayx379@umn.edu)[1], David A. Andow[1] and Edison Sujii[2], [1]Univ. of Minnesota, St. Paul, MN, [2]Embrapa Recursos Genéticos e Biotecnología, Brasília, Brazil

8:50 **0536** Potential predator *Dicyphus hesperus* (Hemiptera: Miridae) for biological control of *Bemisia tabaci* (Hemiptera: Aleyrodidea) on greenhouse tomato. **Pritika Pandey** (pritikapandey@ufl.edu), Univ. of Florida, Gainesville, FL

9:00 **0537** Delivery of pest control services is mediated by the functional composition of predator communities. **Ricardo Perez-Alvarez** (mrp245@cornell.edu), Anthony Polyakov and Katja Poveda, Cornell Univ., Ithaca, NY

9:10 **0538** Ground beetle (Coleoptera: Carabidae) seed preference in semi-arid cover crops. **Sara Carabajal** (scaraba1@uwyo.edu) and Randa Jabbour, Univ. of Wyoming, Laramie, WY

9:20 **0539** European earwig (*Forificula auricularia*) is an underappreciated aphid predator in apple orchards, not a pest. **Robert Orpet** (robert.orpet@wsu.edu)[1], David Crowder[2] and Vincent Jones[1], [1]Washington State Univ., Wenatchee, WA, [2]Washington State Univ., Pullman, WA

9:30 **0540** They're safe and legal, but will entomopathogenic nematodes play ball? **Maxwell Helmberger** (msh326@cornell.edu) and Kyle Wickings, Cornell Univ., Geneva, NY

Grad 10-min: P-IE, Host Plant Resistance

Meeting Room 404 (Convention Center)

Moderator: Shelby J. Fleischer, Pennsylvania State Univ., University Park, PA

8:00 **0541** Impact of inbreeding and *Manduca sexta* herbivory on the transgenerational induction of defense-related traits in horsenettle (*Solanum carolinense*). **Chad Nihranz** (ctn118@psu.edu) and Andrew Stephenson, Pennsylvania State Univ., University Park, PA

8:10 **0542** Gene expression observed from the interaction between *Helicoverpa zea* caterpillars and *Zea mays* tissues. **Kayleigh Diveley** (kr-diveley@wiu.edu) and Richard Musser, Western Illinois Univ., Macomb, IL

8:20 **0543** Shaping crop microbiomes for sustainable pest management: Effects of fungal endophytes on insecticide efficacy against *Aphis gossypii*. **Polly Harding** (pollyharding@tamu.edu) and Gregory Sword, Texas A&M Univ., College Station, TX

8:30 **0544** Comparisons of photosynthetic parameters in tomato genotypes with differing levels of aphid resistance. **Janithri Wickramanayake** (jswickra@uark.edu), Junhuan Xu and Fiona L. Goggin, Univ. of Arkansas, Fayetteville, AR

8:40 **0545** Detoxification of furanocoumarins in the newly invasive moth *Depressaria depressana* (Lepidoptera: Oecophoridae). **Charles-Antoine Dean** (cedean2@illinois.edu) and May Berenbaum, Univ. of Illinois, Champaign, IL

8:50 **0546** Detailed assessment of wheat stem sawfly (*Cephus cinctus* Norton) infestation in barley (*Hordeum vulgare* L.) in Montana. **Buddhi Achhami** (buddhi.achhami@montana.edu)[1], Megan L. Hofland[1], Robert K. D. Peterson[1], Jamie Sherman[1], Gadi V. P. Reddy[2] and David K. Weaver[1], [1]Montana State Univ., Bozeman, MT, [2]Montana State Univ., Conrad, MT

9:00 **0547** Potential mechanisms of plant tolerance to the soybean aphid (*Aphis glycines*). **Kaitlin Chapman** (karmit.chapman@gmail.com), Lia Marchi-Werle, Tiffany Heng-Moss and Joe Louis, Univ. of Nebraska, Lincoln, NE

9:10 **0548** Mind your elders: Wild soybean's contribution to soybean aphid resistance. **Sophia Conzemius** (sophia.conzemius@jacks.sdstate.edu)[1], Louis Hesler[2], Adam Varenhorst[1] and Kelley Tilmon[3], [1]South Dakota State Univ., Brookings, SD, [2]USDA - ARS, Brookings, SD, [3]The Ohio State Univ., Wooster, OH

9:20 **0549** Elucidating the role of reactive oxygen species in aphid resistance of mutant *fatty acid desaturase 7 arabidopsis*. **Hillary Fischer** (hillfisch@gmail.com) and Fiona L. Goggin, Univ. of Arkansas, Fayetteville, AR

9:30 **0550** Water-stress alters plant defense responses toward generalist and specialist spider mites in maize. **Gunbharpur Gill** (gunn.gill@usu.edu)[1], Huyen Bui[2], Richard Clark[2] and Ricardo Ramirez[1], [1]Utah State Univ., Logan, UT, [2]Univ. of Utah, Salt Lake City, UT

9:40 **0551** Effects of reciprocal host plant grafting on emerald ash borer life history traits. **Sara Stack** (librisardor25@me.com), Matthew Ginzel and Clifford Sadof, Purdue Univ., West Lafayette, IN

Grad 10-min: P-IE, IPM, Field Crops 4

Meeting Room 405 (Convention Center)

Moderator: Teresia Nyoike, BASF Corporation, Research Triangle Park, NC

8:00 **0552** Impact of planting date and plant population on soybean defoliation thresholds. **Benjamin Thrash** (bct157@msstate.edu)[1], Angus Catchot[1], Jeff Gore[2], Don Cook[2], Fred Musser[1], Trent Irby[1] and Jason Krutz[2], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

8:10 **0553** Effects of planting date and variety on thrips populations and their injury to cotton in the southeastern United States. **Cody Kerns** (codker92@gmail.com)[1], Jeremy Greene[1], Francis Reay-Jones[2], Alana Jacobson[3], Phillip Roberts[4], Ames Herbert[5], Michael Toews[4], Tim Reed[6], Anthony Greene[1], James Smoak[1] and Dan Robinson[1], [1]Clemson Univ., Blackville, SC, [2]Clemson Univ., Florence, SC, [3]Auburn Univ., Auburn, AL, [4]Univ. of Georgia, Tifton, GA, [5]Virginia Polytechnic Institute and State Univ., Suffolk, VA, [6]Auburn Univ., Madison, AL

8:20 **0554** Impact of early season management decisions on maximizing soybean yield. **John North** (jhn39@msstate.edu)[1], Angus Catchot[1], Jeff Gore[2], Don Cook[2], Trent Irby[1] and John Orlowski[2], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

8:30 **0555** Insect aggregation in soybean in relation to soil and plant health. **Anthony Greene** (adg2@clemson.edu)[1], Cody Kerns[1], Francis Reay-Jones[2] and Jeremy Greene[1], [1]Clemson Univ., Blackville, SC, [2]Clemson Univ., Florence, SC

8:40 **0556** Economic impact of tobacco thrips (*Frankliniella fusca*) feeding injury on peanut. **Pin-Chu Lai** (pclai@uga.edu), Mark R. Abney and Rajagopalbabu Srinivasan, Univ. of Georgia, Tifton, GA

8:50 **0557** Thrips injury and behavior responses to a new Bt trait in cotton. **Scott Graham** (scott.graham@utk.edu) and Scott Stewart, Univ. of Tennessee, Jackson, TN

9:00 **0558** Do soil health practices mitigate or magnify pest outbreaks? **Elizabeth Rowen** (epr5119@psu.edu) and John Tooker, Pennsylvania State Univ., University Park, PA

9:10 **0559** The compounding stresses of tobacco thrips, *Frankinella fusca*, and reniform nematodes, *Rotylenchulus reniformis*, on cotton. **Whitney Crow** (wdc165@msstate.edu)[1], Angus Catchot[1], Jeff Gore[2], Darrin Dodds[1], Don Cook[2] and Tom Allen[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

9:20 **0560** Defoliation in Mississippi peanuts. **Brittany Lipsey** (bse37@msstate.edu)[1], Angus Catchot[1], Jeff Gore[2], Jason Sarver[1], Don Cook[2] and Jason Bond[2], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

9:30 **0561** Ground predators benefits more from semi-natural than natural habitats under harsh climatic conditions. **Maxime Damien** (maxime.damien@univ-rennes1.fr)[1,2], Cécile Le Lann[1], Diab Al Hassan[1], Olivier Jambon[1], Romain Georges[1], Nicolas Desneux[2] and Joan van Baaren[2], [1]Univ. de Rennes, Rennes, France, [2]INRA, Sophia Antipolis, France

9:40 **0562** Effects of single vs. pyramided Bt corn hybrids on the development and fecundity of *Helicoverpa zea* in South Carolina, North Carolina, and Mississippi. **Tom Bilbo** (bilbothomas@yahoo.com)[1], Francis Reay-Jones[1], Dominic Reisig[2], Fred Musser[3] and Jeremy Greene[4], [1]Clemson Univ., Florence, SC, [2]North Carolina State Univ., Plymouth, NC, [3]Mississippi State Univ., Mississippi State, MS, [4]Clemson Univ., Blackville, SC

Grad 10-min: P-IE, IPM, Horticulture

Meeting Room 502 (Convention Center)

Moderator: Jimmy Click, Driscoll's, Oxnard, CA

8:00 **0563** Characterization of the cat-facing pest complex and the spatiotemporal dynamics of cat-facing injury in Florida's peach orchards. **Cory Penca** (cpenca@ufl.edu) and Amanda Hodges, Univ. of Florida, Gainesville, FL

8:10 **0564** Use of companion plants for management of key insect pests and viral incidence in organic squash. **Lorena Lopez** (lorelopezq.257@ufl.edu)[1] and Oscar Liburd[2], [1]Univ. of Florida, Wimauma, FL, [2]Univ. of Florida, Gainesville, FL

8:20 **0565** Study of *Drosophila suzukii* spatial patterns in a mixed-cultivar southern highbush blueberry system. **Lindsy Iglesias** (liglesias@ufl.edu) and Oscar Liburd, Univ. of Florida, Gainesville, FL

8:30 **0566** Evaluating the efficacy of deltamethrin screen row covers for flea beetle control in cabbage and eggplant. **James Mason** (jmason91@vt.edu) and Thomas P. Kuhar, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

8:40 **0567** Effects of genotypic diversity on insect diversity and herbivore fitness in St. Augustine grass. **Brianna Whitman** (bwhitman@ufl.edu), Adam Dale and Jason Kruse, Univ. of Florida, Gainesville, FL

8:50 **0568** Sampling techniques, seasonal dispersion, overwintering sites and management of *Polyphagotarsonemus latus* in primocane blackberries. **Jessica LeFors** (lefors@uark.edu) and Donn Johnson, Univ. of Arkansas, Fayetteville, AR

9:00 **0569** Wildflower plantings in agroecosystems: Effects on beneficial insect communities and biological control of Colorado potato beetle. **Eric Middleton** (middl145@umn.edu) and Christopher R. Philips, Univ. of Minnesota, St. Paul, MN

9:10 **0570** Spray boom mounted deployment of mating disruption technology (SPLAT) in Wisconsin cranberry. **Natalie Eisner** (neisner@wisc.edu)[1], Elissa M. Chasen[1], Brian Luck[1] and Shawn Steffan[2], [1]Univ. of Wisconsin, Madison, WI, [2]USDA - ARS, Madison, WI

Grad 10-min: SysEB, Coleoptera 1

Meeting Room 703 (Convention Center)

Moderators: Ann M. Ray, Xavier Univ., Cincinnati, OH

8:00 **0571** And what is *your* name little weevil? Resolving issues of junior synonymies and cryptic species in North American *Polydrusus*. **Lynne Haynes** (haynl38@oneonta.edu) and Jeffrey Heilveil, State Univ. of New York, Oneonta, NY

8:10 **0572** Unraveling the high diversity in a sexually dimorphic case of extreme neotenous beetles in Puerto Rico (Coleoptera: Lycidae: Leptolycini). **Vinicius Ferreira** (vinicius.sfb@gmail.com), Montana State Univ., Bozeman, MT

8:20 **0573** Diversification patterns of beetles in the highlands of Ecuador. **Sofia Muñoz-Tobar** (smunoz@clemson.edu), Clemson Univ., Clemson, SC

8:30 **0574** Systematics of the New World Conoderinae Schoenherr, 1833 (Coleoptera: Curculionidae). **Salvatore S. Anzaldo** (sanzaldo@asu.edu), Arizona State Univ., Tempe, AZ

8:40 **0575** Population genetics of the endangered Casey's June beetle, *Dinacoma caseyi*. **Jonathan Bradley Reil** (jbreil@hawaii.edu) and Daniel Rubinoff, Univ. of Hawai'i, Honolulu, HI

8:50 **0576** Knowing when to look: The description of a new genus of click beetle (Coleoptera: Elateridae: Dendrometrinae) from the northwestern United States. **Frank Etzler** (fetzler@montana.edu)[1] and Paul J. Johnson[2], [1]Montana State Univ., Bozeman, MT, [2]South Dakota State Univ., Brookings, SD

9:00 **0577** Revisiting Halffter's hypotheses of insect distribution in Mesoamerica: Updates on the phylogeny and biogeography of the tribe Proculini Kaup (1868) (Coleoptera: Passalidae). **Cristian Beza-Beza** (cfbeza@memphis.edu) and Duane D. McKenna, Univ. of Memphis, Memphis, TN

9:10 **0578** Investigating the species distribution of *Synuchus dubius* (Coleoptera: Carabidae) within the Madrean Sky Island Archipelago under past, present, and future climates. **Alan Yanahan** (yanahan@email.arizona.edu) and Wendy Moore, Univ. of Arizona, Tucson, AZ

9:20 **0579** A phylogenetic revision of the blue-green citrus weevils (*Pachnaeus* Schoenherr, 1826). **Brian Reily** (bhreily@asu.edu) and Nico Franz, Arizona State Univ., Tempe, AZ

9:30 **0580** Morphology and gene expression associated with dispersal capability in mountain pine beetle (*Dendroctonus ponderosae*). **Victor Shegelski** (shegelsk@ualberta.ca), Maya Evenden and Felix Sperling, Univ. of Alberta, Edmonton, AB, Canada

9:40 **0581** A 50,000 year insect record from Rancho La Brea, Southern California: Insights into past climate and fossil deposition. **Anna Holden** (aholden@amnh.org)[1,2,3], John Southon[4], Kipling Will[5], Matthew Kirby[6], Rolf Aalbu[7] and Molly Markey[8], [1]American Museum of Natural History, New York, NY, [2]La Brea Tar Pits and Museum, Los Angeles, CA, [3]Natural History Museum, Los Angeles, CA, [4]Univ. of California, Irvine, CA, [5]Univ. of California, Berkeley, CA, [6]California State Univ., Fullerton, CA, [7]California Academy of Sciences, San Francisco, CA, [8]AIR Worldwide, Boston, MA

Grad 10-min: SysEB, Coleoptera and Diptera

Meeting Room 709 (Convention Center)

Moderator: Matthew Bertone, North Carolina State Univ., Raleigh, NC

8:00 **0582** Ultra-conserved elements in Diptera-wide and phorid phylogenies. **Katherine Noble** (k.g.noble@utah.edu)[1], Keith Bayless[2], Michael Branstetter[3], Eliana Buenaventura[4], Lisa Gonzalez[5], Brian V. Brown[5] and Donald Feener[1], [1]Univ. of Utah, Salt Lake City, UT, [2]North Carolina State Univ., Raleigh, NC, [3]USDA - ARS, Logan, UT, [4]Smithsonian Institution, Washington, DC, [5]Natural History Museum, Los Angeles, CA

8:10 **0583** Biotype diversity and genetic variability analysis of different Hessian fly (*Mayetiola destructor*) geographic populations. **Chen Du** (cdu@ksu.edu), Ming-Shun Chen and R. Jeff Whitworth, Kansas State Univ., Manhattan, KS

8:20 **0584** Metagenomics of the food web of the greenhead horse fly (*Tabanus nigrovittatus*) to identify bioindicators of marsh health. **Devika Bhalerao** (dbhale1@lsu.edu), Daniel R. Swale, Lane Foil and Claudia Husseneder, Louisiana State Univ., Baton Rouge, LA

8:30 **0585** How much does height matter? Determining microclimatic effects of height on vertical stratification of wood-boring beetles. **Thomas Sheehan** (thomas.sheehan@uga.edu)[1], Michael D. Ulyshen[2] and Scott Horn[2], [1]Univ. of Georgia, Athens, GA, [2]USDA - Forest Service, Athens, GA

8:40 **0586** Cave springtail (Collembola) phylogeography across the Mississippi River Valley. **Aron Katz** (aronkatz@illinois.edu) and Steven Taylor, Univ. of Illinois, Champaign, IL

8:50 **0587** The search for the neural basis of divergent olfactory preferences in the apple maggot fly, *Rhagoletis pomonella*. **Cheyenne Tait** (ctait@nd.edu)[1], Hinal Kharva[2], Daniel Kritsch[3], Jeffrey Feder[1] and Shannon Olsson[2], [1]Univ. of Notre Dame, Notre Dame, IN, [2]National Centre for Biological Sciences, Bangalore, India, [3]Max Planck Institute for Chemical Ecology, Jena, Germany

9:00 **0588** Heads or tails: Why are dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae and Aphodiinae) attracted to carrion? **Rachel Stone** (rlstone37@gmail.com), Emmy Engasser and Mary Liz Jameson, Wichita State Univ., Wichita, KS

9:10 **0589** Family feud or family reunion? The higher relationships of Nerioidea (Diptera) using molecular data and diverse outgroups. **Morgan Jackson** (morgandjackson@gmail.com)[1], Stephen Marshall[1] and Jeffrey Skevington[2], [1]Univ. of Guelph, Guelph, ON, Canada, [2]Agriculture and Agri-Food Canada, Ottawa, ON, Canada

9:20 **0590** Tachyines from the inside: Internal features of the integument of micro-carabids. **Olivia Boyd** (boydo@oregonstate.edu), Oregon State Univ., Corvallis, OR

9:30 **0591** Illuminating the lampyrid phylogeny via anchored hybrid enrichment. **Gavin Martin** (gmartin33@live.com)[1], Luiz Silveira[2], David Hall[3], Xueyan Li[4], Marc Branham[5], Kathrin Stanger-Hall[3] and Seth M. Bybee[1], [1]Brigham Young Univ., Provo, UT, [2]Univ. Federal do Rio de Janeiro, Rio de Janeiro, Brazil, [3]Univ. of Georgia, Athens, GA, [4]Chinese Academy of Sciences, Kunming, China, [5]Univ. of Florida, Gainesville, FL

Grad 10-min: SysEB, Hymenoptera 1

Meeting Room 504 (Convention Center)

Moderator: Bryan N. Danforth, Cornell Univ., Ithaca, NY

8:00 **0592** Penetrance of *Wolbachia*-mediated parthenogenesis is driven by reproductive rate in a parasitoid wasp. **Amelia Lindsey** (alind005@ucr.edu) and Richard Stouthamer, Univ. of California, Riverside, CA

8:10 **0593** Isolation by distance, environment, and adaptation across latitude and altitude gradients in two montane bumble bees. **Jason Jackson** (jjackson10@crimson.ua.edu)[1], Meaghan Pimsler[1], Kennan Oyen[2], Michael E. Dillon[2], James Strange[3] and Jeffrey D. Lozier[1], [1]Univ. of Alabama, Tuscaloosa, AL, [2]Univ. of Wyoming, Laramie, WY, [3]USDA - ARS, Logan, UT

8:20 **0594** Effects of prescribed fire firequency on ground-dwelling ant communities in longleaf pine flatwoods. **Rachel Atchison** (ratchison@ufl.edu), Jiri Hulcr and Andrea Lucky, Univ. of Florida, Gainesville, FL

8:30 **0595** Drivers of speciation in a tri-trophic system of parasitoids (*Pauesia* spp.), aphids (*Cinara* spp.), and pine (*Pinus* spp.). **Amber Bass** (amber.ih.bass@gmail.com) and Barbara Sharanowski, Univ. of Central Florida, Orlando, FL

8:40 **0596** Assessment of the role of *Wolbachia* in *Blepharoneura* flies and their *Bellopius* parasitoids from the Neotropics. **Tyler Simmonds** (tsim0604@uga.edu)[1], Marty A. Condon[2] and Gaelen Burke[1], [1]Univ. of Georgia, Athens, GA, [2]Cornell College, Mount Vernon, IA

8:50 **0597** Mysteries of Megaspilidae: *Conostigmus* spp. (Hymenoptera: Megaspilidae) of the Nearctic. **Carolyn Trietsch** (carolyntrietsch@gmail.com), István Mikó and Andrew Deans, Pennsylvania State Univ., University Park, PA

9:00 **0598** Alternative reproductive modes in the two social forms of the tropical fire ant, *Solenopsis geminata*. **Kip Lacy** (kipdlacy@uga.edu)[1], DeWayne Shoemaker[2] and Kenneth Ross[1], [1]Univ. of Georgia, Athens, GA, [2]Univ. of Tennessee, Knoxville, TN

9:10 **0599** A different kind of trap-jaw: Functional morphology and mandible strike kinematics of the African snapping ant *Plectroctena mandibularis*. **Josh Gibson** (jcgibso2@illinois.edu) and Andrew Suarez, Univ. of Illinois, Champaign, IL

9:20 **0600** Testing the tri-trophic speciation patterns of parasitoid wasps in the *Peristenus pallipes* complex (Hymenoptera: Braconidae) using genomic data. **Miles Zhang** (yuanmeng.zhang@gmail.com)[1], Amber Bass[1], Diana Fernández[2] and Barbara Sharanowski[1], [1]Univ. of Central Florida, Orlando, FL, [2]Univ. of Windsor, Windsor, ON, Canada

9:30 **0601** Transcriptomic analysis of a novel viral symbiont reveals differential expression during virus replication in parasitoid wasps and fly hosts. **Kelsey Coffman** (kcoffman@uga.edu) and Gaelen Burke, Univ. of Georgia, Athens, GA

9:40 **0602** Inter- and intraspecific variation in larval aggregative behavior covaries with immune response in pine sawflies (Hymenoptera: Diprionidae: *Neodiprion*). **John Terbot, II** (john.terbot.jwt2@gmail.com) and Catherine Linnen, Univ. of Kentucky, Lexington, KY

Grad 10-min: SysEB, Hymenoptera 3

Meeting Room 505 (Convention Center)

Moderator: Michael Branstetter, USDA - ARS, Logan, UT

8:00 **0603** Environmental effects on the composition of *Azteca trigona* nest odor plumes. **Rachel Wells** (rlwell07@louisville.edu), Christopher Frost and Stephen Yanoviak, Univ. of Louisville, Louisville, KY

8:10 **0604** Honey bee hive collapse associated with the combined effects of an invasive ant and viral pathogens. **Evan Brenton-Rule** (evanbrentonrule@gmail.com), James Baty, Jessica Russell, Marion Saunders and Phil Lester, Victoria Univ., Wellington, New Zealand

8:20 **0605** Microsatellite marker development in *Osmia lignaria*, a common and ecologically important North American bee pollinator. **Ashley Rohde** (a.t.rohde@hotmail.com), Utah State Univ., Logan, UT, USDA - ARS, Logan, UT

8:30 **0606** The effect of habitat complexity on the abundance, foraging success, and ecological impact of tawny crazy ants (*Nylanderia fulva*). **MacKenzie Kjeldgaard** (mkjeldgaard@tamu.edu) and Micky Eubanks, Texas A&M Univ., College Station, TX

8:40 **0607** Ant assemblages of coastal Georgia dunes and ants utilizing sea turtle nests. **Charlie Braman** (cabraman@uga.edu) and Brian T. Forschler, Univ. of Georgia, Athens, GA

8:50 **0608** Landscape genetics of a putative urban opportunist: *Xylocopa virginica*. **Kimberly Ballare** (kim.ballare@gmail.com) and Shalene Jha, Univ. of Texas, Austin, TX

9:00 **0609** Does larval rearing environment affect the behavior of adult honey bees, *Apis mellifera* L.? **Ashley Mortensen** (mortensena@ufl.edu) and James D. Ellis, Univ. of Florida, Gainesville, FL

9:10 **0610** Tribal tattoos and color patterns: Lessons from Cirrospilini (Hymenoptera: Eulophidae: Eulophinae). **Ryan Perry** (rperr003@ucr.edu), Univ. of California, Riverside, CA

9:20 **0611** Physiological and molecular responses to social cues in a facultatively social bee (*Megalopta genalis*). **Kate Hunter** (franceskhunter@gmail.com)[1], Callum Kingwell[2], Angelly Vasquez[3], William Wcislo[3] and Karen Kapheim[1], [1]Utah State Univ., Logan, UT, [2]Cornell Univ., Ithaca, NY, [3]Smithsonian Tropical Research Institute, Panama City, Panama

9:30 **0612** Using interaction networks to explain invasion success and community dominance: Wasps in an old and new world. **Oliver Quinn** (oliver.quinn@vuw.ac.nz)[1], Monica Gruber[1], Tom Wenseleers[2] and Phil Lester[1], [1]Victoria Univ., Wellington, New Zealand, [2]Katholieke Univ. Leuven, Heverlee, Belgium

9:40 **0613** Immigrant inviability promotes reproductive isolation among host-associated populations of the gall wasp *Belonocnema treatae*. **Linyi Zhang** (lz41@rice.edu)[1], Glen Hood[1], Mattheau Comerford[1], Robert Busbee[2], Amanda Driscoe[2], James R. Ott[2] and Scott Egan[1], [1]Rice Univ., Houston, TX, [2]Texas State Univ., San Marcos, TX

Grad 10-min: SysEB, Hymenoptera and Isoptera

Meeting Room 506 (Convention Center)

Moderator: Hojun Song, Texas A&M Univ., College Station, TX

8:00 **0614** The beak of the termite: Worker caste feeding morphology as a reflection of diet. **Megan M. Wilson** (meywilson@yahoo.com), Rutgers, The State Univ. of New Jersey, Newark, NJ

8:10 **0615** The evolutionary history of eastern subterranean termites: Refugia and postglacial distributional shifts in the Appalachian Mountains. **Chaz Hyseni** (chyseni@go.olemiss.edu) and Ryan Garrick, Univ. of Mississippi, University, MS

8:20 **0616** Fairyfly fairytale: Unraveling the phylogenetics of Mymaridae (Hymenoptera: Chalcidoidea). **Krissy Dominguez** (cdomi009@ucr.edu) and John M. Heraty, Univ. of California, Riverside, CA

8:30 **0617** Does gut microbiome plasticity mediate species range limits? **Amanda Hale** (ahale004@ucr.edu), Univ. of California, Irvine, CA

8:40 **0618** Urban bee diversity and abundance monitoring using citizen science. **Lisa Mason** (lisa.mason@colostate.edu)[1], Arathi Seshadri[1], Boris Kondratieff[2] and Colton O'Brien[1], [1]Colorado State Univ., Fort Collins, CO, [2]C.P. Gillette Museum of Arthropod Diversity, Fort Collins, CO

Grad 10-min: SysEB, Lepidoptera

Meeting Room 711 (Convention Center)

Moderator: Jennifer Zaspel, Purdue Univ., West Lafayette, IN

8:00 **0619** Effects of habitat on monarch butterfly (*Danaus plexippus*) oviposition and egg and larvae survival. **Andrew Myers** (myersan7@msu.edu), Michigan State Univ., East Lansing, MI

8:10 **0620** Phylogenetics and species hypotheses of *Speyeria* Scudder (1872) butterflies. **Robert de Moya** (rdemoya@pacific.edu)[1], Wesley Savage[2], Chris Tenney[3], Xiaoshan Bao[1], Niklas Wahlberg[4] and Ryan Hill[1], [1]Univ. of the Pacific, Stockton, CA, [2]Univ. of Massachusetts, Lowell, MA, [3]Audubon Society, Monterey, CA, [4]Lund Univ., Lund, Sweden

8:20 **0621** Can characteristics of tiger moth (Erebidae: Arctiinae) anti-bat sounds be predicted from morphology? **Nicolas Dowdy** (njdowdy@gmail.com)[1] and William E. Conner[2], [1]Purdue Univ., West Lafayette, IN, [2]Wake Forest Univ., Winston-Salem, NC

8:30 **0622** Role of diapause in adaptation: Insights from admixed populations of *Lycaedies* butterflies. **Samridhi Chaturvedi** (schaturvedi@aggiemail.usu.edu), Lauren Lucas and Zachariah Gompert, Utah State Univ., Logan, UT

8:40 **0623** The riddle of the Sphinx: Conservation of Hawai'i's endangered Blackburn's sphinx moth, *Manduca blackburni* (Lepidoptera: Sphingidae). **Christine Elliott** (chelliot@hawaii.edu)[1], Cynthia B. A. King[2], Elliott Parsons[3], William Haines[1], Edith Adkins[4] and Daniel Rubinoff[1], [1]Univ. of Hawai'i, Honolulu, HI, [2]Hawai'i Dept. of Land and Natural Resources, Honolulu, HI, [3]Hawai'i Dept. of Land and Natural Resources, Kona, HI, [4]Hawai'i Dept. of Land and Natural Resources, Hilo, HI

8:50 **0624** We'll do it live! Comparative *in vivo* imaging of scale development across insects. **Kyle DeMarr** (kademarr@berkeley.edu), Univ. of California, Berkeley, CA

9:00 **0625** A morphological review of the tiger moth genus *Cosmosoma* (Lepidoptera: Noctuoidea: Erebidae: Arctiini: Euchromiina). **Melissa S. Sisson** (melissa.sisson@und.edu) and Rebecca B. Simmons, Univ. of North Dakota, Grand Forks, ND

9:10 **0626** Revision of *Paralobesia* (Lepidoptera: Tortricidae: Olethreutinae). **Hanna Royals** (hrroyals@gmail.com)[1] and Todd Gilligan[2], [1]Colorado State Univ., Fort Collins, CO, [2]USDA - APHIS, Fort Collins, CO

Undergrad 10-min: P-IE, Miscellaneous

Meeting Room 403 (Convention Center)

Moderator: Diane Alston, Utah State Univ., Logan, UT

8:00 **0627** Competition and host-specificity among *Trissolcus* wasps for egg masses of native and invasive stink bugs. **Krista De Cooke** (nicho452@msu.edu), Ernest Delfosse and Paul Botch, Michigan State Univ., East Lansing, MI

8:10 **0628** Assessing the importance of blow flies as potential pollinators in our ecosystem. **Emily Hildinger** (emilyhildinger@gmail.com), Pierre Lau, Juliana Rangel, Vaughn Bryant and Aaron Tarone, Texas A&M Univ., College Station, TX

8:20 **0629** The community of carrion beetles in conventional and no-till agroecosystems of western Nebraska. **Alexander Lehmann** (alehmann_1@yahoo.com)[1] and Julie Peterson[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, North Platte, NE

8:30 **0630** Effects of cogongrass and climate change on ant communities. **Sara Alvarez** (lasarasota@ufl.edu), Univ. of Florida, Gainesville, FL

8:40 **0631** Presentation withdrawn

8:50 **0632** Taking inventory: Drivers of the bee associated fungi (Genus: *Ascosphaera*) in the solitary mason bee, *Osmia cornifrons*. **Erin Krichilsky** (ek525@cornell.edu), Heather Grab, Mary Centrella and Bryan N. Danforth, Cornell Univ., Ithaca, NY

9:00 **0633** Controlling aphid populations in daylily crops using green lacewings (*Chrysoperla rufilabris*). **Bret Nash** (bret2012@tamu.edu), Texas A&M Univ., College Station, TX

9:10 **0634** Monitoring *Bombus impatiens* in cold storage. **Thuy Tien Lindsay** (tien1438@gmail.com)[1], James Strange[2] and Joyce Knoblett[2], [1]Utah State Univ., Logan, UT, [2]USDA - ARS, Logan, UT

9:20 **0635** Influence of aging on the ovipositional behavior of *Pieris rapae*. **Malcolm Mikkelsen** (malcolm.mikkelsen@washburn.edu), Rodrigo J. Mercader and Tracy Wagner, Washburn Univ., Topeka, KS

9:30 **0636** Effects of host-species on the biotic potential of the Asian parasitoid wasp, *Trissolcus japonicus*. **Emmaline Gates** (gatesemm@msu.edu), Paul Botch and Ernest Delfosse, Michigan State Univ., East Lansing, MI

Undergrad 10-min: SysEB, Miscellaneous

Meeting Room 507 (Convention Center)

Moderator: Stephen Baca, Univ. of Kansas, Lawrence, KS

8:00 **0637** Cryptic, brown, and neglected: First insights into phylogenetic relationships of the speciose assassin bug subfamily Stenopodainae (Hemiptera: Reduviidae). Christiane Weirauch, **Madison Hernandez** (madisonhernandez79@yahoo.com) and Paul Masonick, Univ. of California, Riverside, CA

8:10 **0638** The presence of aquatic Mermithidae in Colorado alpine black fly larvae (Diptera: Simuliidae). **Tiana Bernard** (tianamatsukobernard@gmail.com) and Robert Hancock, Metropolitan State Univ., Denver, CO

8:20 **0639** Efficacy of restoration efforts in the Provo River, Utah with respect to aquatic insect diversity and abundance. **Jared Meek** (jared.meek@gmail.com), Jackson Birrell, Jeffrey Andrus and C. Riley Nelson, Brigham Young Univ., Provo, UT

8:30 **0640** Loss of the giant stonefly, *Pteronarcys californica* in the Provo River, Utah (Insecta: Plecoptera). **Jackson Birrell** (birrell.jackson@gmail.com), Jared Meek and C. Riley Nelson, Brigham Young Univ., Provo, UT

8:40 **0641** Comparing the structure and development of convergent features: Scales in basal hexapods and neopteran insects. **Alex Baransky** (aob2110@columbia.edu)[1] and Steve Davis[2], [1]Columbia Univ., New York, NY, [2]American Museum of Natural History, New York, NY

8:50 **0642** Scale structure and formation in basal insects. **Samuel DeGrey** (spd136@humboldt.edu)[1] and Steve Davis[2], [1]Humboldt State Univ., Arcata, CA, [2]American Museum of Natural History, New York, NY

9:00 **0643** A survey of nasute termite biodiversity along the Guyana-Brazilian border. **Amany Emam** (aye3@njit.edu), Rutgers, The State Univ. of New Jersey, Jersey City, NJ

9:10 **0644** Molecular identification of *Culicoides* biting midges (Diptera: Ceratopogonidae) and detection of filarial nematodes in east-central, Texas. **Elaine Chu** (chu.elaine24@gmail.com), Dongmin Kim, Estelle Martin, Samantha Pena, Cassie Culver, Jamie Benn, Justin Bejcek, Peter Schneider, Sarah Hamer and Gabriel Hamer, Texas A&M Univ., College Station, TX

9:20 **0645** The effects of abdominal rotation on jump performance and stability in the ant *Gigantiops destructor* (Hymenoptera: Formicidae). **Dajia Ye** (dajiaye2@illinois.edu)[1,2], Josh Gibson[2] and Andrew Suarez[2], [1]Boston Univ., Boston, MA, [2]Univ. of Illinois, Champaign, IL

9:30 **0646** Presentation withdrawn

Grad Lightning Bug (3-min): All Sections, Session 2

Four Seasons Ballroom (Convention Center)

Moderator and Organizer: Anthony J. McMechan, Univ. of Nebraska, Lincoln, NE

Due to the rapid speed of delivery, specific times are not listed for individual talks in this section. Each talk will be limited to a total of 3 minutes; talks will be given in sequential order as listed below starting at 9:00 AM with no pauses for no-show presenters.

9:00 AM – 10:00 AM

0647 Upper thermal tolerance within and between tropical termite species (Isoptera: Rhinotermitidae: Termitidae). **Mark Janowiecki** (janowiecki@tamu.edu)[1], Elizabeth Clifton[2], Arián Avalos[3] and Edward Vargo[1], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Connecticut, Storrs, CT, [3]Univ. of Illinois, Champaign, IL

0648 Micro-computed tomography study of *Ixodes scapularis* (Acari: Ixodidae) embryogenesis. **Tanya Josek** (tanyajosek@gmail.com) and Marianne Alleyne, Univ. of Illinois, Champaign, IL

0649 Nitrogen sources for the Formosan subterranean termite. **Aaron Mullins** (amull81@ufl.edu)[1] and Nan-Yao Su[2], [1]Univ. of Florida, Fort Lauderdale, FL, [2]Univ. of Florida, Davie, FL

0650 Epigenetic regulation of insect development and reproduction. **Smitha George** (smitha.george@uky.edu), Univ. of Kentucky, Lexington, KY

0651 Mechanosensitive and chemosensitive sensilla of adults of the agave red worm, *Comadia redtenbacheri* (Lepidoptera: Cossidae). **Ricardo Castro-Torres** (castro.ricardo@colpos.mx) and Celina Llanderal-Cázares, Colegio de Postgraduados, Texcoco, Mexico

0652 An examination of pathogenic and viral transmission among bees in different landscapes. **Tugce Karacoban** (vetkaracoban@gmail.com), Univ. of Nebraska, Lincoln, NE

0653 Disrupted recruitment communication and its impacts on pollen macronutrient composition in foraging *Apis mellifera*. **Tyler Jones** (toj2@psu.edu) and Christina Grozinger, Pennsylvania State Univ., University Park, PA

0654 Building a better urban bee environment. **Katherine Todd** (kjtodd91@gmail.com) and Mary Gardiner, The Ohio State Univ., Columbus, OH

0655 Resistance of new isolated leafy amaranth selections against the green peach aphids, *Myzus persicae*. **Esther Nampeera** (nampeerae@yahoo.com)[1], Lucy K. Murungi[1], John M. Wesonga[1], Komi K. M. Fiaboe[2], Sue Blodgett[3], Gail R. Nonnecke[3] and Mary Abukutsa-Onyango[1], [1]Jomo Kenyatta Univ. of Agriculture and Technology, Nairobi, Kenya, [2]International Centre of Insect Physiology and Ecology, Nairobi, Kenya, [3]Iowa State Univ., Ames, IA

0656 The Pollinator Library: Using plant-pollinator interaction data to make a national impact. **Katie Lamke** (katielamke3@gmail.com)[1], Clint Otto[2] and Judy Wu-Smart[1], [1]Univ. of Nebraska, Lincoln, NE, [2]U.S. Geological Survey, Jamestown, ND

0657 *Helicoverpa zea*: A pest by many names. **Katlyn Catron** (kcatron@vt.edu)[1], Thomas P. Kuhar[1] and Sally Taylor[2], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Virginia Polytechnic Institute and State Univ., Suffolk, VA

0658 Establishment of wildflower islands on Nebraska roadsides to promote native pollinators. **Kayla A. Mollet** (kayla.mollet@huskers.unl.edu), Jon Soper, Walter Schacht and Judy Wu-Smart, Univ. of Nebraska, Lincoln, NE

0659 Evaluating the effectiveness of native wildflowers on wild pollinator abundance and diversity in golf courses. **Grace Cope** (gracecameron@ufl.edu), Univ. of Florida, Gainesville, FL

0660 The role of herbivore- and plant-related experiences in intraspecific host preference of a relatively specialized parasitoid. **Tolulope Morawo** (tom0002@auburn.edu) and Henry Fadamiro, Auburn Univ., Auburn, AL

0661 Investigating forager behavior and movement patterns on trunk-trails of the carpenter ant *Camponotus rufipes*. **Natalie Imirzian** (nsi2@psu.edu) and David Hughes, Pennsylvania State Univ., University Park, PA

0662 Screening and detection of the endosymbiont *Wolbachia* in insect populations of Pakistan. **Bilal Rasool** (bilalisb2001@yahoo.com)[1], Rizwan Rasool[1], Muhammad Adeel[1], Awais Rasool[2], Kashif Zahoor[1] and Farhat Jabeen[1], [1]Government College Univ., Faisalabad, Pakistan, [2]National Agriculture Research Centre, Islamabad, Pakistan

0663 How does aggression facilitate reproduction in a social species (*Bombus terrestris*)? **Ryan Reynolds** (rdr17@psu.edu), Pennsylvania State Univ., University Park, PA

0664 Modelling land use and climate effects on the sustainability of managed bee pollination services in the prairie pothole region. **Ning Li** (ning.li@und.edu)[1], Haochi Zheng[1] and Alisa Gallant[2], [1]Univ. of North Dakota, Grand Forks, ND, [2]U.S. Geological Survey, Sioux Falls, SD

0665 A new host record of *Selitrichodes neseri* Kelly (Hymenoptera: Eulophidae). **Kristin Wolfe** (kcole006@ucr.edu), Univ. of California, Riverside, CA

0666 NADPH-cytochrome P450 reductase is involved in multiple acaricide resistance in the generalist herbivore, *Tetranychus urticae* Koch. **Adekunle Adesanya** (adekunle.adesanya@wsu.edu)[1], Mariany Morales[1], Laura Lavine[1], Doug Walsh[2] and Fang (Rose) Zhu[1], [1]Washington State Univ., Pullman, WA, [2]Washington State Univ., Prosser, WA

Grad 10-min: MUVE, Diptera, Flies

Meeting Room 302 (Convention Center)

Moderator: Dana Nayduch, USDA - ARS, Manhattan, KS

10:00 **0667** Presentation withdrawn

10:10 **0668** Cantaloupe facilitates transmission of *Salmonella typhimurium* between adult house flies. **Jessica Thomson** (jessiel@ksu.edu)[1], Kathleen Yeater[2], Ludek Zurek[1] and Dana Nayduch[3], [1]Kansas State Univ., Manhattan, KS, [2]USDA - ARS, Fort Collins, CO, [3]USDA - ARS, Manhattan, KS

10:20 **0669** Redefining the North American distribution of *Culicoides sonorensis* and *Culicoides variipennis*, vectors of bluetongue and epizootic hemorrhagic disease. **Phillip Shults** (ptshults@tamu.edu)[1], Edward Vargo[1] and Lee Cohnstaedt[2], [1]Texas A&M Univ., College Station, TX, [2]USDA - ARS, Manhattan, KS

10:30 **0670** Who, where, and when? A survey of Texas blow flies (Diptera: Calliphoridae). **Ashleigh Faris** (ashmfaris@gmail.com), Meagan Fitzgerald and Aaron Tarone, Texas A&M Univ., College Station, TX

10:40 **0671** Food preferences of *Calliphora vicina* among human and non-human trophic substrates. **M. Denise Gemmellaro** (denise.gemmellaro@rutgers.edu) and George C. Hamilton, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

10:50 **0672** The influence of eastern red cedar on Tabanidae populations in Oklahoma. **Kylie Sherrill** (kyliekd@okstate.edu), Justin Talley, Bruce Noden and Laura Goodman, Oklahoma State Univ., Stillwater, OK

11:00 **0673** Using remote sensors to identify pests of veterinary importance. **Levi Zahn** (levi.zahn@ucr.edu) and Alec Gerry, Univ. of California, Riverside, CA

11:10 **0674** Effect of cattle management systems on dung arthropod community structure and pest maggot populations. **Jacob Pecenka** (jacob.pecenka@gmail.com)[1,2] and Jonathan Lundgren[2], [1]Purdue Univ., West Lafayette, IN, [2]Ecdysis Foundation, Estelline, SD

Grad 10-min: MUVE, Diptera, Mosquitoes 2

Meeting Room 303 (Convention Center)

Moderator: Mustapha Debboun, Harris County Public Health, Houston, TX

10:00 **0675** The effects of *Juniperus virginiana* (eastern red cedar) on mosquito populations in the Great Plains region of Oklahoma. **Noel Cote'** (noel.cote@okstate.edu) and Bruce Noden, Oklahoma State Univ., Stillwater, OK

10:10 **0676** Optimised conditions for the handling, transport and release of sterile male mosquitoes. **Nicole Culbert** (nicole.j.culbert@gmail.com)[1], Rosemary Lees[2], Marc J.B. Vreysen[1], Alistair Darby[3] and Jeremie Gilles[4], [1]International Atomic Energy Agency, Vienna, Austria, [2]Liverpool School of Tropical Medicine, Liverpool, United Kingdom, [3]Univ. of Liverpool, Liverpool, United Kingdom, [4]Monash Univ., Melbourne, Australia

10:20 **0677** Impact of insulin signaling in the fat body of *Anopheles stephensi* alters immune response and enhances resistance to *Plasmodium falciparum* infection. **Lewis Hun** (Lewisvibulhun@email.arizona.edu)[1], Elizabeth Brooks[1], Shirley Luckhart[2] and Michael A. Riehle[1], [1]Univ. of Arizona, Tucson, AZ, [2]Univ. of California, Davis, CA

10:30 **0678** Building capacity for NGS data analysis in sub-Saharan Africa to improve public health research. **Joseph Receveur** (josephreceveur@gmail.com)[1], Luc Djogbenou[2] and M. Eric Benbow[1], [1]Michigan State Univ., East Lansing, MI, [2]Univ. d'Abomey-Calavi, Ouidah, Benin

10:40 **0679** Which of these things is not like the other? Ecological comparisons of *Culex pipiens* and *Culex quinquefasciatus.* **Catherine Dean** (catherine.dean@usm.edu) and Donald Yee, Univ. of Southern Mississippi, Hattiesburg, MS

10:50 **0680** Lab strain *Anopheles quadrimaculatus* midgut microbial community and the effects of wild larval rearing environments on microbiome and *Plasmodium berghei* infection. **Eleanor Moen** (emm606@msstate.edu) and Jonas G. King, Mississippi State Univ., Mississippi State, MS

11:00 **0681** Population as cohort: Interpreting the mortality patterns of wild-caught adult mosquitos of unknown ages. **Sarah Silverman** (ssilverman@ucdavis.edu) and James R. Carey, Univ. of California, Davis, CA

11:10 **0682** Mosquito species (Diptera: Culicidae) diversity from ovitraps in two Mesoamerican tropical forests. **Luis Romero** (luis.romerovega@ucr.ac.cr)[1], Luis Chaverri[2] and Luis Chaves[1], [1]Univ. de Costa Rica, San José, Costa Rica, [2]Univ. Estadal a Distancia, San José, Costa Rica

11:20 **0683** Effects of prior temperature and precipitation on West Nile virus infection in *Culex quinquefasciatus* Say in Harris County, Texas. **Karen Poh** (karenpoh@tamu.edu)[1], Mikyoung Jun[1], Daikwon Han[1], Rudy Bueno[1], Martin Reyna[2], Mustapha Debboun[2] and Gabriel Hamer[1], [1]Texas A&M Univ., College Station, TX, [2]Harris County Public Health, Houston, TX

11:30 **0684** Presentation withdrawn

Grad 10-min: PBT, Pollinators

Meeting Room 301 (Convention Center)

Moderators: Uli Bernier[1] and Joel Coats[2], [1]USDA - ARS, Gainesville, FL, [2]Iowa State Univ., Ames, IA

10:00 **0685** Making scents of urban pollination: Does air pollution alter honey bee memory? **Ryan Leonard** (ryan.leonard@sydney.edu.au), Vanina Vergoz, Clare McArthur and Dieter Hochuli, Univ. of Sydney, Sydney, Australia

10:10 **0686** Changes in cuticular hydrocarbon profiles during swarming of honey bee *Apis mellifera*. **Kyungmun Kim** (kkamboosi@snu.ac.kr), Sang Hyeon Kim, Jae Ho Lee, Seung Hee Han and Si-Hyeock Lee, Seoul National Univ., Seoul, South Korea

10:20 **0687** Ryanodine receptor modulators and muscle fatigue in honey bees (*Apis mellifera*). **Jennifer Williams** (jwilliams90@huskers.unl.edu) and Troy Anderson, Univ. of Nebraska, Lincoln, NE

10:30 **0688** Heterocyclic amines reduce forage contact of honey bees. **Nicholas Larson** (nlarson@vt.edu)[1], Ulrich Bernier[2], Jeffrey Bloomquist[3] and Troy Anderson[4], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]USDA - ARS, Gainesville, FL, [3]Univ. of Florida, Gainesville, FL, [4]Univ. of Nebraska, Lincoln, NE

10:40 **0689** Top-down toxicology: The queen honey bee (*Apis mellifera*) pesticide exposome and its downstream impacts. **Joseph Milone** (jpmilone@ncsu.edu) and David Tarpy, North Carolina State Univ., Raleigh, NC

10:50 **0690** A new design for 10-day adult chronic toxicity tests: Exposing honey bees (*Apis mellifera*) to active ingredients in a wax matrix. **Cameron Jack** (cjack@ufl.edu)[1], Andrea Ditto[1], Pingli Dai[1,2], Jeffrey Bloomquist[1] and James Ellis[1], [1]Univ. of Florida, Gainesville, FL, [2]Chinese Academy of Agricultural Sciences, Beijing, China

11:00 **0691** Honey bee (*Apis mellifera*, L.) queen rearing environment affects behavior and physiology. **Elizabeth Walsh** (walshe@tamu.edu), Mark Janowiecki, Edward Vargo, Stephen Sweet and Juliana Rangel, Texas A&M Univ., College Station, TX

11:10 **0692** Are honey bees (*Apis mellifera*) feeling antsy? Ants as possible reservoirs of honey bee pathogens. **Alexandria Payne** (alexnpayne@gmail.com)[1] and Juliana Rangel[2], [1]Texas A&M Univ., Spring, TX, [2]Texas A&M Univ., College Station, TX

11:20 **0693** Common garden experiments reveal local adaptation in critical thermal limits of bumble bees (Apidae, *Bombus*). **Kennan Oyen** (koyen@uwyo.edu)[1], Meaghan Pimsler[2], James Herndon[3], Jason Jackson[2], James Strange[4], Jeffrey Lozier[2] and Michael E. Dillon[1], [1]Univ. of Wyoming, Laramie, WY, [2]Univ. of Alabama, Tuscaloosa, AL, [3]Utah State Univ., Logan, UT, [4]USDA - ARS, Logan, UT

11:30 **0694** Vibrational quantitation and long-term *in-situ* monitoring of honeybee (*Apis mellifera*) dorsoventral abdominal shaking signals using accelerometer technology. **Michael-Thomas Ramsey** (n0530709@ntu.ac.uk), Martin Bencsik and Michael Newton, Nottingham Trent Univ., Nottingham, United Kingdom

Grad 10-min: P-IE, Behavior

Meeting Room 503 (Convention Center)

Moderator: Helen Spafford, Univ. of Hawai'i, Honolulu, HI

10:00 **0695** Milkweed (*Asclepias* spp.) patch size and density effects on monarch butterfly (*Danaus plexippus*) oviposition within Iowa prairies and roadsides. **Teresa Blader** (teresablader@gmail.com)[1], Sue Blodgett[1] and Richard Hellmich[2], [1]Iowa State Univ., Ames, IA, [2]USDA - ARS, Ames, IA

10:10 **0696** Estimating perceptional range of the monarch butterfly (*Danaus plexippus*) with an automated radio telemetry system. **Kelsey E. Fisher** (kefisher@iastate.edu), Steven P. Bradbury and James Adelman, Iowa State Univ., Ames, IA

10:20 **0697** Long term consequences of acute heat developmental stress in *Apis mellifera*. **Carlos Vega Melendez** (carlos.vega1991@yahoo.com), Univ. of North Carolina, Greensboro, NC

10:30 **0698** Use of a cue hierarchy for host plant selection in *Pieris rapae* (Lepidoptera: Pieridae) oviposition. **Margaret Lund** (lundmar6@msu.edu) and Zsofia Szendrei, Michigan State Univ., East Lansing, MI

10:40 **0699** Sharing the throne: Induced polygyny in honey bees (*Apis mellifera*). **James Withrow** (jmwithro@ncsu.edu) and David Tarpy, North Carolina State Univ., Raleigh, NC

10:50 **0700** Characterizing the interactions between spotted wing drosophila and its yeast associates. **Margaret Lewis** (mtlewis@umd.edu) and Kelly Hamby, Univ. of Maryland, College Park, MD

11:00 **0701** Analyzing oriental beetle behavior in proximity to pheromone point sources in novel attract-&-kill scenario. **Robert Holdcraft** (rholdcra@rci.rutgers.edu)[1], Cesar Rodriguez-Saona[2], Agenor Mafra-Neto[3] and Lukasz Stelinski[4], [1]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ, [2]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [3]ISCA Technologies, Inc, Riverside, CA, [4]Univ. of Florida, Lake Alfred, FL

11:10 **0702** Evaluating gypsy moth larval movement potential and effective barriers limiting their movement. **Jacob Wittman** (wittm094@umn.edu)[1], Paul Chaloux[2], Scott W. Myers[3] and Brian Aukema[1], [1]Univ. of Minnesota, St. Paul, MN, [2]USDA - APHIS, Riverdale, MD, [3]USDA - APHIS, Buzzards Bay, MA

11:20 **0703** Behavioral responses of *Drosophila suzukii* winter and summer morphs to visual and olfactory cues. **Danielle Kirkpatrick** (kirkpa42@msu.edu), Heather Leach, Rufus Isaacs and Larry Gut, Michigan State Univ., East Lansing, MI

11:30 **0704** Evaluating the flight behavior between *Drosophila suzukii* winter and summer morphs. **Anh Tran** (aktran@umn.edu)[1], Mark Asplen[2] and William Hutchison[1], [1]Univ. of Minnesota, St. Paul, MN, [2]Metropolitan State Univ., St. Paul, MN

Grad 10-min: P-IE, Biological Control, Parasitoids

Meeting Room 501 (Convention Center)

Moderator: Bonnie Pendleton, West Texas A&M Univ., Canyon, TX

10:00 **0705** Biocontrol of *Megacopta cribraria* eggs in Mississippi. **Bill McRight** (wmm150@msstate.edu)[1], Fred Musser[1], Angus Catchot[1], Don Cook[2] and Jeff Gore[2], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

10:10 **0706** Evaluation of the *Aphidius colemani-Rhopalosiphum padi* banker plant system in Oklahoma greenhouse production. **Tracey Payton Miller** (tracey.payton@okstate.edu)[1], Eric Rebek[1], Steven Frank[2], Kris Giles[1] and Mike Schnelle[1], [1]Oklahoma State Univ., Stillwater, OK, [2]North Carolina State Univ., Raleigh, NC

10:20 **0707** The stratification of the brown marmorated stink bug (*Halyomorpha halys*) and its natural enemies in a common wild tree host. **Nicole F. Quinn** (quinni01@vt.edu)[1], Tracy C. Leskey[2] and Christopher Bergh[1], [1]Virginia Polytechnic Institute and State Univ., Winchester, VA, [2]USDA - ARS, Kearneysville, WV

10:30 **0708** Predation and parasitism of sentinel egg masses of the brown marmorated stink bug in established and more recently colonized areas of Kentucky. **Lauren Fann** (lefa228@uky.edu)[1], Ric Bessin[1] and Raul T. Villanueva[2], [1]Univ. of Kentucky, Lexington, KY, [2]Univ. of Kentucky, Princeton, KY

10:40 **0709** Potential native egg parasitoid community of brown marmorated stink bug (*Halyomorpha halys* Stål) in organic and conventionally managed fruit orchards in southern Pennsylvania. **Hillary Morin** (hjm5194@psu.edu)[1], Andrew Deans[1] and Greg Krawczyk[2], [1]Pennsylvania State Univ., University Park, PA, [2]Pennsylvania State Univ., Biglerville, PA

10:50 **0710** Effect of release time and diapause on reproductive biology of newly introduced emerald ash borer parasitoid, *Oobius agrili*, in the Mid-Atlantics. **Devan George** (devgeo1117@gmail.com)[1], Jian Duan[2] and Douglas W. Tallamy[1], [1]Univ. of Delaware, Newark, DE, [2]USDA - ARS, Newark, DE

11:00 **0711** Effect of biotic and abiotic factors along an urbanization gradient on natural enemies and implications for biological control of emerald ash borer (*Agrilus planipennis*). **Jacqueline Hoban** (jhoban@udel.edu)[1], Jian Duan[2], Kristopher J. Abell[1] and Paula M. Shrewsbury[1], [1]Univ. of Maryland, College Park, MD, [2]USDA - ARS, Newark, DE

11:10 **0712** Phenology and overwintering survivial of the introduced larval parasitoids of emerald ash borer in the northeast. **Michael I. Jones** (mijone01@syr.edu)[1], Juli Gould[2] and Melissa K. Fierke[1], [1]State Univ. of New York, Syracuse, NY, [2]USDA - APHIS, Buzzards Bay, MA

11:20 **0713** Seasonal synchrony: The phenology of emerald ash borer, *Agrilus planipennis*, and its parasitoids in a southern climate. **James Palmer** (jpalme22@vols.utk.edu)[1], Jerome F. Grant[1], Gregory J. Wiggins[1] and Juli Gould[2], [1]Univ. of Tennessee, Knoxville, TN, [2]USDA - APHIS, Buzzards Bay, MA

11:30 **0714** Host specificity and adaption of laboratory reared *Ontsira mellipes* (Hymenoptera: Braconidae) to the invasive pest, *Anoplophora glabripennis* (Coleoptera: Cerambycidae). **Julian Golec** (juliang@udel.edu)[1], Jian Duan[2], Kaitlin Rim[2], Ellen M. Aparicio[2] and Judith A. Hough-Goldstein[1], [1]Univ. of Delaware, Newark, DE, [2]USDA - ARS, Newark, DE

Grad 10-min: P-IE, Chemical Ecology, Climate Change, and Ecology

Meeting Room 403 (Convention Center)

Moderator: Neelendra Joshi, Univ. of Arkansas, Fayetteville, AR

10:00 **0715** Does habitat design and landscape context structure lady beetle (Coleoptera: Coccinellidae) communities in cities? **Denisha Parker** (parker.1052@osu.edu) and Mary Gardiner, The Ohio State Univ., Columbus, OH

10:10 **0716** Isolation by adaptation in *Monochamus clamator:* Host plants as a population level pressure. **Patrick Gorring** (psg7@cornell.edu) and Brian Farrell, Harvard Univ., Cambridge, MA

10:20 **0717** How darkness affects perception of imminent danger by maize. **Arash Maleki** (fum123@psu.edu), Irmgard Adams and James Tumlinson, Pennsylvania State Univ., University Park, PA

10:30 **0718** Landscape-dependent effects of intraspecific crop diversity on cruciferous pest populations. **Lauren Snyder** (lds97@cornell.edu) and Alison Power, Cornell Univ., Ithaca, NY

10:40 **0719** Longevity, consumption and oviposition of emerald ash borer (*Agrilus planipennis*) on novel hosts. **Donnie Peterson** (peterson.143@wright.edu) and Don Cipollini, Wright State Univ., Dayton, OH

10:50 **0720** The effect of caterpillar oral secretions on green leaf volatiles. **Anne Jones** (acj152@psu.edu), James Tumlinson and Gary Felton, Pennsylvania State Univ., University Park, PA

11:00 **0721** Effect of nonnative vegetation on arthropod communities in urban forest fragments. **J. Christina Mitchell** (jcmitch5@ncsu.edu)[1], Steven D. Frank[1] and Vincent D'Amico[2], [1]North Carolina State Univ., Raleigh, NC, [2]USDA - Forest Service, Newark, DE

11:10 **0722** Host plant mediated indirect effects of temperature on herbivores. **Aleix Valls** (aleix.valls@ndsu.edu) and Jason Harmon, North Dakota State Univ., Fargo, ND

11:20 **0723** Host plant usage predicts variation in preference and performance of the neotropical tortoise beetle *Chelymorpha alternans*. **Colin Morrison** (colinmorrison85@gmail.com)[1,2], Clement Aubert[2,3] and Donald Windsor[2], [1]Univ. of Texas, Austin, TX, [2]Smithsonian Tropical Research Institute, Panama City, Panama, [3]Univ. de Montpellier, Montpelier, France

Grad 10-min: P-IE, Invasive Species, Resistance Management, Social Insects, and Transgenic Crops

Meeting Room 404 (Convention Center)

Moderator: Ram B. Shrestha, Iowa State Univ., Ames, IA

10:00 **0724** Landscape level contributions of corn, cotton, and soybean in mixed production systems for *Helicoverpa zea* populations. **Tyler Towles** (tt305@entomology.msstate.edu)[1], Angus Catchot[1], Jeff Gore[2], Don Cook[2] and Michael Caprio[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

10:10 **0725** Impact of field history on western corn rootworm susceptibility to Cry3Bb1 in Nebraska. **Jordan Reinders** (jordan.reinders3@gmail.com) and Lance J. Meinke, Univ. of Nebraska, Lincoln, NE

10:20 **0726** Western corn rootworm abundance, injury to corn, and Bt resistance in landscapes surrounding previous problem fields. **Coy St. Clair** (cstclair@iastate.edu)[1], Aaron J. Gassmann[1] and Graham P. Head[2], [1]Iowa State Univ., Ames, IA, [2]Monsanto Company, St. Louis, MO

10:30 **0727** Effects of feeding on transgenic corn plants producing Cry1Fa toxin on flight behavior of *Spodoptera frugiperda*. **Lucas Hietala** (lhietal1@vols.utk.edu), Kimberly Gwinn and Juan Luis Jurat-Fuentes, Univ. of Tennessee, Knoxville, TN

10:40 **0728** Sterol modified plants: A novel strategy for controlling insect herbivore pests. **Wei (Ivy) Chen** (ivychan527@tamu.edu)[1], Keyan Zhu-Salzman[1], S. T. Behmer[1] and Robert J. Grebenok[2], [1]Texas A&M Univ., College Station, TX, [2]Canisius College, Buffalo, NY

10:50 **0729** The effects of sugarcane aphid (*Melanaphis sacchari*) density in sorghum on predation. **Jeremy Hewlett** (jhewl@tamu.edu), Texas A&M Univ., College Station, TX

11:00 **0730** Measuring sperm viability in male *Bombus impatiens* as they age. **James Herndon** (james.herndon85@gmail.com)[1], James P. Strange[2], Karen Kapheim[1], Lee Rickords[1], Amber D. Tripodi[2] and Evan Peterson[1], [1]Utah State Univ., Logan, UT, [2]USDA - ARS, Logan, UT

11:10 **0731** Sugar preferences of native and invasive ants. **Quoc Nguyen** (nguye380@tamu.edu), Texas A&M Univ., College Station, TX

11:20 **0732** Interindividual variation in learning ability and its influence on performance and lifespan in the honeybee, *Apis mellifera*. **Catherine Tait** (catait@rams.colostate.edu) and Dhruba Naug, Colorado State Univ., Fort Collins, CO

11:30 **0733** Evaluation of two reduced-risk foliar insecticides in managing neonicotinoid-resistant tobacco thrips in cotton. **Damon D'Ambrosio** (dadambro@ncsu.edu), Anders Huseth and George G. Kennedy, North Carolina State Univ., Raleigh, NC

11:40 **0734** Utility of eDNA based surveillance of invasives in terrestrial systems. **Rafael Valentin** (rafael.valentin@me.com)[1], Julie Lockwood[1], Anne Nielsen[2], George C. Hamilton[1], Tracy C. Leskey[3] and Dina M. Fonseca[1], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ, [3]USDA - ARS, Kearneysville, WV

Grad 10-min: P-IE, IPM, Field Crops 3

Meeting Room 405 (Convention Center)

Moderator: Michael Shaw, Dow AgroSciences, Indianapolis, IN

10:00 **0735** A novel insect sampling device and associated collection method for strawberries. **Emily Bick** (enbick@ucdavis.edu) and Christian Nansen, Univ. of California, Davis, CA

10:10 **0736** A transgenic approach to controlling tarnished plant bug (*Lygus lineolaris*) in mid-south cotton. **John Corbin** (jc971@msstate.edu)[1], Angus Catchot[1], Jeff Gore[2], Don Cook[2] and Darrin Dodds[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

10:20 **0737** Determining the effect of fall armyworm, *Spodoptera frugiperda*, defoliation on rice yield. **Layton McCullars** (ldmccull@uark.edu)[1] and Gus Lorenz[2], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Arkansas, Lonoke, AR

10:30 **0738** Tarnished plant bug (*Lygus lineolaris*) infestations and spray timing in Mid-Atlantic cotton. **Seth Dorman** (sjdorman@vt.edu), Sean Malone and Sally Taylor, Virginia Polytechnic Institute and State Univ., Suffolk, VA

10:40 **0739** Comparison of native and exotic brome grasses as hosts of the wheat stem sawfly and their potential for use as trap crops. **Rekha Bhandari** (wrekha3@gmail.com), Tracy M. Sterling and David K. Weaver, Montana State Univ., Bozeman, MT

10:50 **0740** The feeding and reproductive behavior of global haplotypes of sugarcane aphid, *Melanaphis sacchari* (Zehntner) (Aphididae). **Greg Wilson** (gregwils@tamu.edu)[1] and David Kerns[2], [1]Texas A&M Univ., Bryan, TX, [2]Texas A&M Univ., College Station, TX

11:00 **0741** Spatial correlation in *Helicoverpa zea* susceptibility to Bt corn across North Carolina. **Shawnee Gundry** (scgundry@ncsu.edu)[1], Dominic Reisig[2] and Hannah Burrack[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Plymouth, NC

11:10 **0742** Effects of nitrogen and water on *Helicoverpa zea* behavior in Bt cotton. **Lewis Braswell** (lrbraswe@ncsu.edu)[1], Dominic Reisig[2], Clyde E. Sorenson[1] and Guy Collins[3], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Plymouth, NC, [3]North Carolina State Univ., Rocky Mount, NC

11:20 **0743** The benefits of succotash: Mixing forage crops to manage arthropod pest populations and abiotic stress. **Julie Baniszewski** (jxb585@psu.edu), Amanda Burton, Greg Roth, Armen Kemanian and John Tooker, Pennsylvania State Univ., University Park, PA

11:30 **0744** The potential for horizontal transmission of *Helicoverpa armigera* nucleopolyhedrovirus within a soybean field. **Joseph Black** (jblack@uaex.edu) and Gus Lorenz, Univ. of Arkansas, Lonoke, AR

11:40 **0745** Evaluating fall armyworm thresholds in whorl stage corn for the state of Mississippi. **Keiton Croom** (klc409@msstate.edu)[1], Don Cook[2], Angus Catchot[1], Jeff Gore[2] and William Henry[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

Grad 10-min: P-IE, Vectors of Plant Diseases

Meeting Room 502 (Convention Center)

Moderator: Alton Sparks, Univ. of Georgia, Tifton, GA

10:00 **0746** Bactericides in Florida citrus and their effects of the Asian citrus psyllid, *Diaphorina citri* Kuwayama (Hemiptera: Liviidae). **Eliott Smith** (esmith5@ufl.edu) and Kirsten Pelz-Stelinski, Univ. of Florida, Lake Alfred, FL

10:10 **0747** Identifying and detailing the role of insects in the spread of *Erwinia amylovora*, a devastating disease of rosaceous crops. **Matthew Boucher** (mtb245@cornell.edu), Kerik Cox and Gregory Loeb, Cornell Univ., Geneva, NY

10:20 **0748** Evidence for symbiont promiscuity in two invasive ambrosia beetles (Coleoptera: Scolytinae: *Euwallacea* spp.). **Christine Dodge** (cdodg001@ucr.edu), Joseph Carrillo, Akif Eskalen and Richard Stouthamer, Univ. of California, Riverside, CA

10:30 **0749** Seasonal and regional distributions, and phoresy rates of the major vectors of oak wilt fugus, *Ceratocystis fagacearum*, in Wisconsin. **Stephanie Jagemann** (sjagemann@wisc.edu)[1], Jennifer Juzwik[2], Patrick Tobin[3] and Kenneth Raffa[1], [1]Univ. of Wisconsin, Madison, WI, [2]USDA - Forest Service, St. Paul, MN, [3]Univ. of Washington, Seattle, WA

10:40 **0750** Effects of a *Begomovirus* on the preference and fitness of its vector, *Bemisia tabaci*. **Saurabh Gautam** (sg37721@uga.edu), Bhabesh Dutta, Timothy Coolong and Rajagopalbabu Srinivasan, Univ. of Georgia, Tifton, GA

10:50 **0751** The impact of variety, insecticide seed treatment, and foliar insecticide applications on aphids and barley yellow dwarf virus in wheat. **Clay Perkins** (clamperk@vols.utk.edu)[1], Scott Stewart[1], Heather Kelly[1] and Angus Catchot[2], [1]Univ. of Tennessee, Jackson, TN, [2]Mississippi State Univ., Mississippi State, MS

11:00 **0752** Field corn as a green bridge host for the wheat curl mite and its associated viruses. **Elliot Knoell** (elliotknoell@yahoo.com) and Gary Hein, Univ. of Nebraska, Lincoln, NE

11:10 **0753** Presentation withdrawn

11:20 **0754** Evaluation of insects as potential vectors of *Dickeya dianthicola* in potato agrosystems. **Jonas Insinga** (jki@insinga.com), Andrei Alyokhin, Nayara Marangoni and Jianjun Hao, Univ. of Maine, Orono, ME

11:30 **0755** Effects of host plant identity on virus-induced changes in chemical phenotypes and vector behavior. **Tessa Shates** (tshat003@ucr.edu), Ian M. Wright, Quentin Chesnais and Kerry Mauck, Univ. of California, Riverside, CA

Grad 10-min: SysEB, Acari, Araneae, Opiliones, Orthoptera, Phasmatodea, and Phthiraptera

Meeting Room 506 (Convention Center)

Moderator: Grey Gustafson, Univ. of Kansas, Lawrence, KS

10:00 **0756** Experimental evolution of parasitic feather lice (Insecta: Phthiraptera: Ischnocera) reveals a magic trait that triggers ecological speciation. **Scott Villa** (scott.villa@gmail.com), Sarah E. Bush and Dale H. Clayton, Univ. of Utah, Salt Lake City, UT

10:10 **0757** Integrative species delimitation in the harvestman subfamily Briggsinae (Opiliones, Laniatores). **Allan Cabrero** (acabrero67@gmail.com)[1,2] and Marshal Hedin[1], [1]San Diego State Univ., San Diego, CA, [2]Univ. of California, Berkeley, CA

10:20 **0758** Density-dependent phenotypic plasticity of non-swarming *Schistocerca* (Orthoptera: Acrididae). **Shelby Kilpatrick** (entorocks527@tamu.edu)[1], Bert Foquet[1], Drew Little[1], Steve Gotham[2] and Hojun Song[1], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Central Florida, Orlando, FL

10:30 **0759** Metagenomic gut content analysis reveals niche differentiation in an adaptive radiation of Hawaiian spiders. **Susan Kennedy** (fourjaws@berkeley.edu)[1], Martha Alexandra Rueda Esteban[2], Henrik Krehenwinkel[1] and Rosemary Gillespie[1], [1]Univ. of California, Berkeley, CA, [2]Univ. de los Andes, Bogotá, Colombia

10:40 **0760** Using radio telemetry to understand leaf masquerading behavior in *Mimetica* Pictet, 1888. **Ryan Selking** (optimus1@tamu.edu) and Hojun Song, Texas A&M Univ., College Station, TX

10:50 **0761** Systematics of closely related species in the *Haemaphysalis* (*Rhipistoma*) *leachi* group. **Jackson Tomlinson** (jt04558@georgiasouthern.edu) and Dmitry Apanaskevich, Georgia Southern Univ., Statesboro, GA

11:00 **0762** Presentation withdrawn

11:10 **0763** An illustrated key to the Pyrgomorphidae genera of the world (Orthoptera: Caelifera). **Ricardo Mariño-Pérez** (pselliopus@yahoo.com.mx) and Hojun Song, Texas A&M Univ., College Station, TX

11:20 **0764** Ecomorph evolution: The giant stick insects of Papua New Guinea and their tiny ancestors. **Yelena M. Pacheco** (yelena.marlese@gmail.com)[1], Sven Bradler[2], James A. Robertson[3] and Michael F. Whiting[1], [1]Brigham Young Univ., Provo, UT, [2]Georg-August-Univ., Göttingen, Germany, [3]Univ. of Arizona, Tucson, AZ

Grad 10-min: SysEB, Coleoptera 2

Meeting Room 703 (Convention Center)

Moderator: Jason Hansen, USDA - APHIS, Los Indios, TX

10:00 **0765** Population divergences of palm flower weevils: Differences between mutualists and antagonists. **Bruno de Medeiros** (souzademedeiros@fas.harvard.edu) and Brian D. Farrell, Harvard Univ., Cambridge, MA

10:10 **0766** Systematic revision of the firefly genus *Robopus* Motschulsky 1853 (Coleoptera: Lampyridae). **Oliver Keller** (okeller1977@gmail.com) and Marc Branham, Univ. of Florida, Gainesville, FL

10:20 **0767** Effect of emerald ash borer (*Agrilus planipennis*, Coleoptera: Buprestidae) invasion on biodiversity of wood inhabiting arthropods of green ash trees in Louisiana. **Balwinder Kaur** (bkaur2@lsu.edu), Louisiana State Univ., Baton Rouge, LA

10:30 **0768** Fracture mechanics and evolution of resilient cuticle in the rostrum of *Curculio* Linnaeus, 1758. **Michael Andrew Jansen** (entojansen@gmail.com), Nikhilesh Chawla and Nico Franz, Arizona State Univ., Tempe, AZ

10:40 **0769** DNA barcoding of nematodes recovered from soil baiting in Nebraska corn fields. **Camila Oliveira-Hofman** (coliveirahofman@gmail.com)[1], Thomas Powers[1], Lance J. Meinke[1] and Julie Peterson[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, North Platte, NE

10:50 **0770** The influence of habitat and abiotic factors on carrion beetle (Coleoptera: Silphidae) communities found on small mammal carrion in the Kansas Flint Hills. **Emmy Engasser** (eldudeck@gmail.com), Rachel Stone and Mary Liz Jameson, Wichita State Univ., Wichita, KS

11:00 **0771** Fitness costs associated with spinosad resistance in the Colorado potato beetle (*Leptinotarsa decemlineata*). **Coby Klein** (cklein@gradcenter.cuny.edu) and Mitchell Baker, City Univ. of New York Queens College, Flushing, NY

11:10 **0772** Dung beetle (Coleoptera: Scarabaeinae) species diversity in Cameroon. **Christie Sukhdeo** (christie.sukhdeo@gmail.com), Univ. of New Orleans, New Orleans, LA

11:20 **0773** Presentation withdrawn

11:30 **0774** Prey-driven control of aquatic beetle predator assemblages. **Matthew Pintar** (matthew.pintar@gmail.com) and William Resetarits, Univ. of Mississippi, University, MS

11:40 **0775** Dung beetle functional traits related to restoration management practices in tallgrass prairie. **Sheryl Hosler** (shosler1@niu.edu), Peyton Whiston, Holly Jones and Nicholas Barber, Northern Illinois Univ., DeKalb, IL

Grad 10-min: SysEB, Hemiptera

Meeting Room 711 (Convention Center)

Moderator: James A. Robertson, Univ. of Arizona, Tucson, AZ

10:00 **0776** Ecological niche shift: Predicting the potential biological invasion of kudzu bug (*Megacopta cribraria*) in North and South America. **Wanwan Liang** (wliang@vols.utk.edu)[1], Liem Tran[1], Robert Washington-Allen[1], Gregory J. Wiggins[1], Scott Stewart[2], James T. Vogt[1,3] and Jerome F. Grant[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Univ. of Tennessee, Jackson, TN, [3]USDA - Forest Service, Knoxville, TN

10:10 **0777** Diversity of hickory phylloxerans (Hemiptera: Phylloxeridae: *Phylloxera* spp.) and their gall morphologies in the U.S. **Fredericka Hamilton** (fbh0006@auburn.edu) and Nate Hardy, Auburn Univ., Auburn, AL

10:20 **0778** Are *Wolbachia* co-obligate nutritional symbionts in the banana aphid *Pentalonia*? **Clesson Higashi** (clessonh@uga.edu) and Kerry M. Oliver, Univ. of Georgia, Athens, GA

10:30 **0779** No guts, no glory: Revealing the diet of flower-associated assassin bugs (Heteroptera: Reduviidae). **Paul Masonick** (pmaso001@ucr.edu), Madison Hernandez and Christiane Weirauch, Univ. of California, Riverside, CA

10:40 **0780** Phylogenomics of Auchenorrhyncha using transcriptomes. **Rachel Skinner** (rskinn2@illinois.edu)[1], Christopher H. Dietrich[1], Kimberly K. O. Walden[1], Lars Podsiadlowski[2], Malte Petersen[3], Hugh M. Robertson[1] and Kevin P. Johnson[1], [1]Univ. of Illinois, Champaign, IL, [2]Univ. of Bonn, Bonn, Germany, [3]Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany

10:50 **0781** Vacillating *Vallotia*: Does a switch in metabolic role influence the course of symbiont genome decay in adelgids (Hemiptera: Sternorrhyncha: Adelgidae)? **Kathryn Weglarz** (kathryn.weglarz@usu.edu)[1], Gaelen Burke[2], Nathan Havill[3] and Carol von Dohlen[1], [1]Utah State Univ., Logan, UT, [2]Univ. of Georgia, Athens, GA, [3]USDA - Forest Service, Hamden, CT

11:00 **0782** Comparative microbiome analysis and evolution of the primarily herbivorous true bugs, Mirioidea (Hemiptera: Miridae: Tingidae: Thaumastocoridae) utilizing multiplex PCR and Illumina sequencing. **Eric Gordon** (erg55@cornell.edu) and Christiane Weirauch, Univ. of California, Riverside, CA

11:10 **0783** Dark (sub)family connections: Exploring evolutionary relationships of the Mirinae (Hemiptera: Miridae). **Carlos Rosas Sánchez** (crosa012@ucr.edu) and Christiane Weirauch, Univ. of California, Riverside, CA

11:20 **0784** Two new species of Darnini (Hemiptera: Membracidae) from Colombia and Peru. **Laura Gonzalez-Mozo** (lacgonzalezmo@unal.edu.co), Rutgers, The State Univ. of New Jersey, Piscataway, NJ

11:30 **0785** Demographic data informs a habitat restoration plan for *Nysius wekiuicola* on the summit of Maunakea Volcano, Hawai'i. **Jessica Kirkpatrick** (jakirkpa@hawaii.edu) and Jesse A. Eiben, Univ. of Hawai'i, Hilo, HI

11:40 **0786** Zombie bugs: Searching for a pathogen that induces egg cannibalism in the big-eyed bug *Geocoris pallens*. **Nicholas Booster** (nbooster@ucdavis.edu)[1], Asaf Sadeh[2], Michael Culshaw-Maurer[1], Tobias Gerhard Mueller[1], Sijun Liu[3], Bryony Bonning[3] and Jay Rosenheim[1], [1]Univ. of California, Davis, CA, [2]Agricultural Research Organization, Rishon Letsion, Israel, [3]Iowa State Univ., Ames, IA

Grad 10-min: SysEB, Hymenoptera 2

Meeting Room 504 (Convention Center)

Moderator: István Mikó, Pennsylvania State Univ., University Park, PA

10:00 **0787** Taxonomic review of Genus *Trissolcus* Ashmead (Hymenoptera: Scelionidae) from South Korea. **Sanghyeok Nam** (as0324@snu.ac.kr) and Seunghwan Lee, Seoul National Univ., Seoul, South Korea

10:10 **0788** The impact of GC bias on phylogenetic accuracy using ultraconserved phylogenomic data: A case study on the corbiculate bees. **Silas Bossert** (sb2346@cornell.edu)[1], Elizabeth Murray[1], Bonnie Blaimer[2] and Bryan N. Danforth[1], [1]Cornell Univ., Ithaca, NY, [2]Smithsonian Institution, Washington, DC

10:20 **0789** Chemosensory receptor evolution in the parasitic wasp *Trissolcus basalis* (Hymenoptera: Platygastridae) and its implications for speciation. **Huayan Chen** (chen.4084@osu.edu)[1], Elijah Talamas[2], Zachary Lahey[1] and Norman Johnson[1], [1]The Ohio State Univ., Columbus, OH, [2]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

10:30 **0790** Elucidating the evolution of in-flight mating in thynnine wasps (Tiphiidae: Thynninae) using 3D imaging. **Tom Semple** (thomas.semple@anu.edu.au)[1], Nikolai J. Tatarnic[2] and Rod Peakall[1], [1]The Australian National Univ., Canberra, Australia, [2]Western Australian Museum, Welshpool, Australia

10:40 **0791** The biogeography of Oraseminae (Hymenoptera: Eucharitidae): Countercurrent dispersals of ants and their parasitoids. **Austin Baker** (bakerau73@gmail.com) and John M. Heraty, Univ. of California, Riverside, CA

10:50 **0792** Investigating the social organization and population structure of two broadly sympatric, cryptic species (Hymenoptera, Formicidae). **Mari West** (mwest008@ucr.edu) and Jessica Purcell, Univ. of California, Riverside, CA

11:00 **0793** Infectivity of wax- and airborne honey bee (*Apis mellifera*) viruses. **Megan Colwell** (colwellm@myumanitoba.ca)[1], Rob Currie[1] and Stephen Pernal[2], [1]Univ. of Manitoba, Winnipeg, MB, Canada, [2]Agriculture and Agri-Food Canada, Beaverlodge, AB, Canada

11:10 **0794** Host-food plant complex sources and hybrids of the parasitic wasp, *Cotesia congregata* (Braconidae), differ in patterns of relative expression of bracovirus genes. **Justin Bredlau** (bredlauj@vcu.edu)[1], Karen Kester[1], Dawn Gundersen-Rindal[2] and Daniel Kuhar[2], [1]Virginia Commonwealth Univ., Richmond, VA, [2]USDA - ARS, Beltsville, MD

11:20 **0795** Infiltrating the hive mind: Immune and viral effects in honey bees (*Apis mellifera*). **Amy Geffre** (acgeffre@iastate.edu), Bryony Bonning, Adam Dolezal and Amy Toth, Iowa State Univ., Ames, IA

11:30 **0796** The effect of target quality and type on the behavior of tandem recruiters in the ant *Temnothorax rugatulus*. **J. Yohan Cho** (john.cho@asu.edu) and Stephen C. Pratt, Arizona State Univ., Tempe, AZ

11:40 **0797** The effects of maternal care on gene expression and DNA methylation in the subsocial bee *Ceratina calcarata*. **Samuel Arsenault** (sva@uga.edu)[1], Brendan Hunt[2] and Sandra Rehan[3], [1]Univ. of Georgia, Athens, GA, [2]Univ. of Georgia, Griffin, GA, [3]Univ. of New Hampshire, Durham, NH

Grad 10-min: SysEB, Hymenoptera 4

Meeting Room 505 (Convention Center)

Moderator: John M. Heraty, Univ. of California, Riverside, CA

10:00 **0798** Diseases in ant colonies: Should we expect epidemic collapse? **Lauren Quevillon** (leq103@psu.edu), Jessica Conway and David Hughes, Pennsylvania State Univ., University Park, PA

10:10 **0799** The evolution of antimicrobials in ant societies. **Omar Halawani** (ohalawa@ncsu.edu)[1], Adrian A. Smith[2], Clint Penick[1], Stephanie Mathews[3], Margarita López-Uribe[1] and Rob R. Dunn[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina Museum of Natural Sciences, Raleigh, NC, [3]Campbell Univ., Buies Creek, NC

10:20 **0800** Presentation withdrawn

10:30 **0801** The effect of liana removal on aboreal ant communities in an early successional forest. **Benjamin Adams** (benjamin.adams@louisville.edu)[1], Evan Gora[1], Michiel van Breugel[2], Jefferson Hall[2], Stefan Schnitzer[3] and Stephen Yanoviak[1], [1]Univ. of Louisville, Louisville, KY, [2]Smithsonian Tropical Research Institute, Balboa Ancon, Panama, [3]Marquette Univ., Milwaukee, WI

10:40 **0802** The role of vision in nestmate recognition and resource identification in tropical ants. **Daniella Prince** (daniella.prince@louisville.edu) and Stephen Yanoviak, Univ. of Louisville, Louisville, KY

10:50 **0803** Gene regulatory differences between alate gynes from monogyne and polygyne colonies of the red imported fire ant (*Solenopsis invicta*). **Joan King** (joanie.mars@uga.edu)[1,2], Samuel Arsenault[1], Sasha Kay[3], Kip Lacy[1], Kenneth Ross[1] and Brendan Hunt[3], [1]Univ. of Georgia, Athens, GA, [2]Texas A&M Univ., College Station, TX, [3]Univ. of Georgia, Griffin, GA

11:00 **0804** The cues of colony size: How honey bees sense that their colony is large enough to begin to invest in reproduction. **Michael Smith** (mls453@cornell.edu), Cornell Univ., Ithaca, NY

11:10 **0805** Phylogenomics of Platygastroidea (Hymenoptera: Proctotrupomorpha). **Zachary Lahey** (lahey.18@osu.edu), Huayan Chen and Norman Johnson, The Ohio State Univ., Columbus, OH

11:20 **0806** The genetic and mechanistic basis of worker sterility in the honey bee. **Isobel Ronai** (isobel.ronai@sydney.edu.au), Benjamin Oldroyd, Deborah Barton and Vanina Vergoz, Univ. of Sydney, Sydney, Australia

11:30 **0807** The price of insurance: Costs and benefits of worker production in a facultatively incipiently social bee. **Wyatt Shell** (was2000@wildcats.unh.edu) and Sandra Rehan, Univ. of New Hampshire, Durham, NH

11:40 **0808** Inclusive fitness and social plasticity in the Australian small carpenter bee (*Ceratina australensis*). **Robert Oppenheimer** (roblouopp@gmail.com) and Sandra Rehan, Univ. of New Hampshire, Durham, NH

Grad 10-min: SysEB, Neuroptera, Odonata, and Others

Meeting Room 709 (Convention Center)

Moderator: Daniel Rubinoff, Univ. of Hawai'i, Honolulu, HI

10:00 **0809** Understanding the northernmost dragonfly *Somatochlora sahlbergi*. **Manpreet Kohli** (mkk24@njit.edu)[1], Jessica Ware[1] and Göran Sâhlen[2], [1]Rutgers, The State Univ. of New Jersey, Newark, NJ, [2]Halmstad Univ., Halmstad, Sweden

10:10 **0810** Discovering relationships and geographic barriers in *Anax* dragonflies. **Rebecca Clement** (rebeclem@gmail.com)[1,2], Preston Arnold[1] and Seth M. Bybee[1], [1]Brigham Young Univ., Provo, UT, [2]George Washington Univ., Washington, DC

10:20 **0811** Burrowed in natural history: Analysis of life stage collection in Gomphidae. **Emily Sandall** (els22@psu.edu) and Andrew Deans, Pennsylvania State Univ., University Park, PA

10:30 **0812** Impact of bluestain fungi (Ascomycota: Ophiostomatoid) on ant diversity in coarse woody debris. **Casey Morin** (cmm111@latech.edu)[1], Juliet Tang[2], Courtney Siegert[3], Nathan Little[3], John Riggins[4] and Natalie Clay[1], [1]Louisiana Tech Univ., Ruston, LA, [2]USDA - Forest Service, Starkville, MS, [3]USDA - ARS, Stoneville, MS, [4]Mississippi State Univ., Mississippi State, MS

10:40 **0813** Spongillafly biology in Utah (Neuroptera: Sisyridae: *Climacia californica*). **Makani Fisher** (makanifisher@comcast.net)[1], Robert Mower[2] and C. Riley Nelson[1], [1]Brigham Young Univ., Provo, UT, [2]Utah County Mosquito Abatement, Spanish Fork, UT

10:50 **0814** Presentation withdrawn

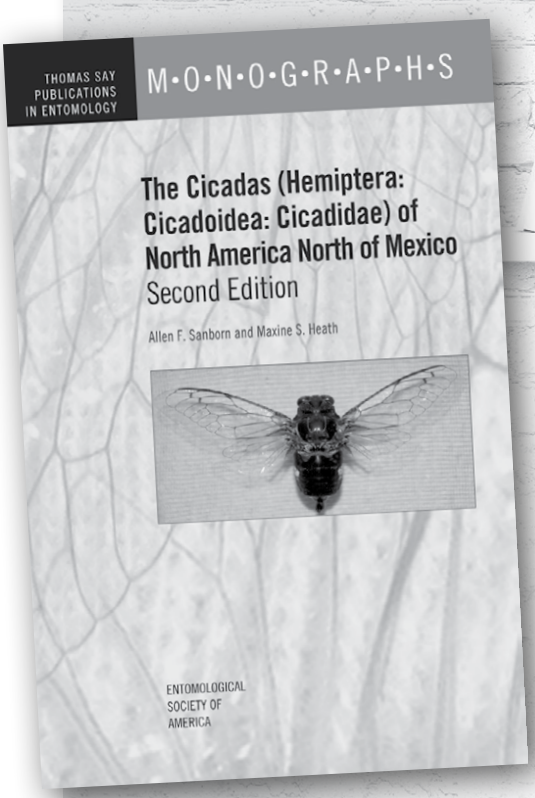
11:00 **0815** Insects of the Guyana shield: Diversity and distribution within primary forest canopies. **Stephanie Mafla-Mills** (sjm372@scarletmail.rutgers.edu) and Jessica Ware, Rutgers, The State Univ. of New Jersey, Newark, NJ

11:10 **0816** Shortening inter-patch distances in fish enclosures increases biomass, and alters community composition of emergent aquatic insects. **Kristopher Pitcher** (kristopher.pitcher@coyotes.usd.edu) and Daniel Soluk, Univ. of South Dakota, Vermillion, SD

11:20 **0817** Limbs or buds? Skeletomuscular anatomy supports interordinal homologies of male genitalia across the Endopterygota, and with the ninth abdominal appendages of the apterygote orders (Arthropoda: Hexapoda: Ectognatha). **Brendon Boudinot** (beboudinotb@ucdavis.edu), Univ. of California, Davis, CA

11:30 **0818** Solving the rubyspot mystery, a phylogeny of *Hetaerina* and *Mnesarete* (Odonata: Calopterygidae). **Samantha Smith** (samantha.gysler.smith@gmail.com)[1,2], Rebecca Clement[3], Jonathan Drury[4], Rhainer Guillermo-Ferreira[5], Greg Grether[4], Melissa Sanchez Herrera[6], Jessica Ware[6] and Seth M. Bybee[1], [1]Brigham Young Univ., Provo, UT, [2]Univ. of California, Riverside, CA, [3]George Washington Univ., Washington, DC, [4]Univ. of California, Los Angeles, CA, [5]Univ. Federal de São Carlos, Sao Carlos, Brazil, [6]Rutgers, The State Univ. of New Jersey, Newark, NJ

11:40 **0819** Compiling the Odonate phylogeny to assess ancestral relationships. **Robert J. Erickson** (robert.j.erickson@byu.edu) and Seth M. Bybee, Brigham Young Univ., Provo, UT



Fully revised and updated!

The Cicadas of North America North of Mexico, Second Edition

By Allen F. Sanborn and Maxine S. Heath

The authors of the Thomas Say monograph *The Cicadas of North America North of Mexico* return with a revised and expanded edition of their bestselling work, presented in full color. The new edition includes 172 species and 22 subspecies of cicadas found in continental North America north of Mexico, representing 18 genera from eight tribes in three subfamilies within the family Cicadidae. The higher taxonomy is updated from the first edition, based on more recently proposed taxa. Information on the distribution of each species is now provided.

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Monday, November 6, 2017 • AFTERNOON

Lunch and Learn: Inspiring Science through Storytelling

Meeting Room 601/603 (Convention Center)

Moderators and Organizers: Robert K. D. Peterson[1] and Rayda K. Krell[2], [1]Montana State Univ., Bozeman, MT, [2]Western Connecticut State Univ., Danbury, CT

12:15 PM - 1:30 PM

Lunch and Learn: Science Policy 101 for the Entomologist

Meeting Room 705/707 (Convention Center)

Moderators and Organizers: Ashley Kennedy[1], Thomas Anderson[2], Katelyn Kesheimer[3], Ana Vélez[4], Lina Bernaola[5], Jason Cryan[6], Cindy Simpson[7], Donna Dean[7], Erin Cadwalader[8] and Chris Stelzig[9], [1]Univ. of Delaware, Newark, DE, [2]Anderson IPM Solutions, Clayton, NC, [3]Texas A&M Univ., Lubbock, TX, [4]Univ. of Nebraska, Lincoln, NE, [5]Louisiana State Univ., Baton Rouge, LA, [6]North Carolina Museum of Natural Sciences, Raleigh, NC, [7]Association for Women in Science, Washington, DC, [8]Lewis-Burke Associates, Washington, DC, [9]Entomological Society of America, Annapolis, MD

12:15 PM - 2:45 PM

Lunch and Learn: *This Week in Science* Podcast Live Taping!

Meeting Room 605/607 (Convention Center)

Moderators and Organizers: Johanna Elsensohn[1], Rob R. Dunn[1], Kirsten Sanford[2], Justin Jackson[2] and Blaire Bazdarich[2], [1]North Carolina State Univ., Raleigh, NC, [2]*This Week In Science*, Davis, CA

12:15 PM - 2:45 PM

PBT Section Symposium: Pesticide Exposure Assessment for Non-*Apis* Bees: Inspiring Research for Innovative Solutions

Meeting Room 301 (Convention Center)

Moderators and Organizers: Natalie Boyle[1], Theresa Pitts-Singer[1], and Bridget O'Neill[2], [1]USDA - ARS, Logan, UT, [2]DuPont Crop Protection, Newark, DE

1:00 **0820** Workshop: Pesticide exposure assessment paradigm for non-*Apis* bees. **Rajwinder Singh** (rajwinder.singh@basf.com)[1], Silvia Hinarejos[2], Richard Bireley[3], Jordi Bosch[4], Wayne Hou[5], Theresa Pitts-Singer[6], Thomas Steeger[7] and Neal M. Williams[8], [1]BASF Corporation, Research Triangle Park, NC, [2]Valent U.S.A. LLC, Dublin, CA, [3]California Dept. of Pesticide Regulation, Sacramento, CA, [4]Univ. Autònoma de Barcelona, Cerdanyola del Vallès, Spain, [5]Pest Management Regulatory Agency, Ottawa, ON, Canada, [6]USDA - ARS, Logan, UT, [7]U.S. Environmental Protection Agency, Washington, DC, [8]Univ. of California, Davis, CA

1:15 **0821** Method for estimating pesticide exposure for honey bees (*Apis mellifera*) and considerations for estimating exposures to other species of bees and insects. **Kristina Garber** (garber.kristina@epa.gov), U.S. Environmental Protection Agency, Washington, DC

1:30 **0822** Pesticide exposure assessment for non-*Apis* bees: An industry perspective. **Silvia Hinarejos** (silvia.hinarejos@valent.com)[1] and Rajwinder Singh[2], [1]Valent U.S.A. LLC, Dublin, CA, [2]BASF Corporation, Research Triangle Park, NC

1:45 **0823** Solitary bee pesticide exposure risks. **Theresa Pitts-Singer** (theresa.pitts-singer@ars.usda.gov)[1], Fabio Sgolastra[2], Natalie Boyle[1], Andi Kopit[3] and Jordi Bosch[4], [1]USDA - ARS, Logan, UT, [2]Università di Bologna, Bologna, Italy, [3]Utah State Univ., Logan, UT, [4]Univ. Autònoma de Barcelona, Cerdanyola del Vallès, Spain

2:00 **0824** The challenges of assessing the impacts of pesticide exposure on bumblebees (*Bombus* spp.). **Nigel Raine** (nraine@uoguelph.ca), Univ. of Guelph, Guelph, ON, Canada

2:15 **0825** Risk assessment to stingless bees: Where we are, where we want to go. **Roberta Nocelli** (robertanocelli@terra.com.br), Univ. Federal de São Carlos, Araras, Brazil

2:30 **0826** Concluding remarks and future directions. **Natalie Boyle** (natalie.boyle@ars.usda.gov), USDA - ARS, Logan, UT

2:45 **Roundtable Discussion**

P-IE Section Symposium: Novel DNA-Based Methods to Reveal Diets of Beneficial Insects

Meeting Room 703 (Convention Center)

Moderators and Organizers: Debora Pires Paula[1] and David A. Andow[2], [1]Embrapa Cenargen, Brasília, Brazil, [2]Univ. of Minnesota, St. Paul, MN

1:00 **Introductory Remarks**

1:15 **0827** Predation detection: Simple outcomes arise from complex processes. **Donald C. Weber** (don.weber@ars.usda.gov), USDA - ARS, Beltsville, MD

1:30 **0828** High-throughput sequencing of the brood: Colony level trophic interactions of red imported fire ant (*Solenopsis invicta*). **Jason Wulff** (j_wulff@tamu.edu), MacKenzie Kjeldgaard, Gregory Sword and Micky Eubanks, Texas A&M Univ., College Station, TX

1:45 **0829** Multi-locus metabarcoding reveals springtime foraging patterns of the honey bee, *Apis mellifera,* in central Ohio, USA. **Rodney Richardson** (richardson.827@osu.edu)[1], Hailey Curtis[2], Chia Hua-Lin[2] and Reed Johnson[2], [1]The Ohio State Univ., Columbus, OH, [2]The Ohio State Univ., Wooster, OH

2:00 **SP0830** Trophic interactions in contrasting production systems: MiSeq versus multiplex PCR. **Jason Schmidt** (jschmid2@uga.edu)[1], Dawn Olson[2], Stephane Boyer[3], Henrik Krehenwinkel[4] and Alisa Coffin[2], [1]Univ. of Georgia, Tifton, GA, [2]USDA - ARS, Tifton, GA, [3]Univ. de Tours, Tours, France, [4]Univ. of California, Berkeley, CA

2:10 **0831** Eliminating false prey identifications from predator gut contents detected by DNA methods. **David A. Andow** (dandow@umn.edu)[1], Roberto Togawa[2] and Debora Pires Paula[2], [1]Univ. of Minnesota, St. Paul, MN, [2]Embrapa Cenargen, Brasília, Brazil

2:25 **0832** Revealing predator diets through marker-free DNA shotgun sequencing of gut contents. **Debora Pires Paula** (debora.pires@embrapa.br)[1], Renata Timbó[2], Roberto Togawa[1] and David A. Andow[3], [1]Embrapa Cenargen, Brasília, Brazil, [2]Univ. de Brasília, Brasília, Brazil, [3]Univ. of Minnesota, St. Paul, MN

2:40 **0833** What's next? Technical and analytical challenges for molecular analysis of trophic interactions and ecological networks. **Matthew Greenstone** (matt.greenstone@ars.usda.gov), USDA - ARS, Beltsville, MD

Member Symposium: Entomology and Entomologists at Predominantly Undergraduate Institutions: Status, Challenges, and Prospects

Meeting Room 404 (Convention Center)

Moderators and Organizers: Lieceng Zhu[1] and Rizana M. Mahroof[2], [1]Fayetteville State Univ., Fayetteville, NC, [2]South Carolina State Univ., Orangeburg, SC

1:00 **Introductory Remarks**

1:05 **0834** Overcoming challenges and limitations in directing research at an HBCU: Out of the classroom and in to the laboratory. **Rizana M. Mahroof** (rmahroof@scsu.edu), South Carolina State Univ., Orangeburg, SC

1:20 **0835** Leveraging all resources: The key to survival and relevancy at an HBCU. **Shirley Chao** (schao@unfsu.edu), Fayetteville State Univ., Fayetteville, NC

1:35 **0836** Learning a thing or two from the ant and locust. **Sheila Prabhakar-Abraham** (sabraham@seu.edu), Southeastern Univ., Lakeland, FL

1:50 **0837** Potential challenges and opportunities in the entomological research and academics for a leading 1890 institution-FAMU. **Muhammad Haseeb** (muhammad.haseeb@famu.edu) and Lambert Kanga, Florida A&M Univ., Tallahassee, FL

2:05 **0838** Entomology at Tennessee State University: An HBCU perspective on status, challenge and prospect. **Kaushalya Amarasekare** (kamarase@tnstate.edu), Tennessee State Univ., Nashville, TN

2:20 **0839** Promoting student interest in entomology: The intersection of public health and agriculture. **Gloria McCutcheon** (gmccutcheon@claflin.edu), Claflin Univ., Orangeburg, SC

2:35 **0840** Experiential learning: A stimulant to teaching integrated pest management to undergraduate students at Alcorn State University. **Tahir Rashid** (trashid@alcorn.edu)[1] and Daniel Collins[2], [1]Alcorn State Univ., Mound Bayou, MS, [2]Alcorn State Univ., Alcorn State, MS

2:50 **Panel Discussion**

Member Symposium: Innovative Research on Climate Change across the USA and Latin America: 5th Latin American/Hispanic Symposium

Meeting Room 405 (Convention Center)

Moderators and Organizers: Silvia Rondon[1], Ana Legrand[2], Ismael E. Badillo[3] and Jesus Lara[4], [1]Oregon State Univ., Hermiston, OR, [2]Univ. of Connecticut, Storrs, CT, [3]Texas A&M Univ., Weslaco, TX, [4]Univ. of California, Riverside, CA

1:00 **Welcoming Remarks**

1:05 **0841** How temperature associated with climate change influence insect community and population dynamics. **Silvia Rondon** (silvia.rondon@oregonstate.edu)[1], Milton Gamarra[2], Rene Gomez[3], Alfonso Del Rio[4], Jiwan Palta[4], John Bamberg[5] and David Ellis[3], [1]Oregon State Univ., Hermiston, OR, [2]Andes, Cuzco, Peru, [3]International Potato Center, Lima, Peru, [4]Univ. of Wisconsin, Madison, WI, [5]USDA - ARS, Sturgeon Bay, WI

1:20 **0842** Elevated CO_2 influences plant-virus-vector interactions. **Nilsa A. Bosque-Pérez** (nbosque@uidaho.edu)[1] and Piotr Trebicki[2], [1]Univ. of Idaho, Moscow, ID, [2]Dept. of Economic Development, Horsham, Australia

1:35 **0843** Mexico as a major center for agro-biodiversity: Implications under future climate changes. **Yolanda Chen** (yolanda.chen@uvm.edu), Univ. of Vermont, Burlington, VT

1:50 **Break**

2:00 **0844** Extreme weather events and network stability in a tropical plant-caterpillar-parasitoid community. **Danielle Salcido** (dsalcido@nevada.unr.edu)[1], Lee A. Dyer[1], Lora Robinson[1], Angela Smilanich[1], Humberto Garcia[2] and Will Lumpkin[1], [1]Univ. of Nevada, Reno, NV, [2]La Selva Biological Research Station, San José, Costa Rica

2:15 **0845** Presentation withdrawn

2:30 **0846** The effects of a warming climate on the phenology and fitness of Rocky Mountain grasshoppers. **César R. Nufio** (cnufio@nsf.gov), Univ. of Colorado, Boulder, CO

2:45 **Panel Discussion**

Member Symposium: Phenotypic Plasticity: Cause and Consequence in Insect Sociality

Meeting Room 709 (Convention Center)

Moderators and Organizers: Alexander Walton[1] and Beryl Jones[2], [1]Iowa State Univ., Ames, IA, [2]Univ. of Illinois, Champaign, IL

1:00 **0847** Does resource limitation promote cooperation? Nutrition restriction and social cohesion in insect societies. **Alexander Walton** (awalton@iastate.edu) and Amy Toth, Iowa State Univ., Ames, IA

1:15 **0848** Evaluating the mechanisms underlying individual variation in social and reproductive dominance in bees. **Christina M. Grozinger** (cmgrozinger@psu.edu)[1], David Galbraith[1], Ryan Reynolds[1], Naomi Altman[1], Jonathan Cnaani[2], Abraham Hefetz[3] and Soojin Yi[4], [1]Pennsylvania State Univ., University Park, PA, [2]BizBee, Ein Yahav, Israel, [3]Tel Aviv Univ., Tel Aviv, Israel, [4]Georgia Institute of Technology, Atlanta, GA

1:30 **0849** Prospects for elucidating the evolution of eusociality. **Timothy A. Linksvayer** (tlinks@sas.upenn.edu), Univ. of Pennsylvania, Philadelphia, PA

1:45 **0850** Genomic signatures of social plasticity in a facultatively eusocial bee, *Megalopta genalis*. **Karen Kapheim** (karen.kapheim@usu.edu), Utah State Univ., Logan, UT

2:00 **0851** How the egg-yolk protein vitellogenin may genetically regulate behavioral development in honeybee workers. **Gyan Harwood** (gyan.harwood@asu.edu), Arizona State Univ., Tempe, AZ

2:15 **0852** Conserved genes regulate phenotypic plasticity in an incipiently social bee. **Sandra Rehan** (sandra.rehan@unh.edu), Univ. of New Hampshire, Durham, NH

2:30 **0853** Genomics, epigenetics, and phenotypic plasticity in social insects. Linh Chau, Carl Dyson and **Michael Goodisman** (michael.goodisman@biology.gatech.edu), Georgia Institute of Technology, Atlanta, GA

2:45 **0854** Flexible castes in social wasps: Nutritional and social environments shape transcriptomic fate. **Amy Toth** (amytoth@iastate.edu), Iowa State Univ., Ames, IA

Member Symposium: Processes that Drive the Population Dynamics of Forest Insects: Celebrating the Contributions of Professor Ken Raffa (University of Wisconsin-Madison)

Meeting Room 505 (Convention Center)

Moderators and Organizers: Richard Hofstetter[1], Nathan Havill[2], and Kimberly Wallin[3], [1]Northern Arizona Univ., Flagstaff, AZ, [2]USDA - Forest Service, Hamden, CT, [3]Univ. of Vermont, Burlington, VT

1:00 **0855** Ken's early years: Lessons and memories from Ken Raffa's first generation of students. **Richard Hofstetter** (rich.hofstetter@nau.edu), Northern Arizona Univ., Flagstaff, AZ

1:15 **0856** Understanding intricate *Dendroctonus* and *Pinus* relationships: The past matters. **Barbara Bentz** (bbentz@fs.fed.us), USDA - Forest Service, Logan, UT

1:30 **0857** Establishment success and outbreak dynamics in the gypsy moth: A Wisconsin Northwoods paradox. **Patrick Tobin** (pctobin@uw.edu)[1] and Kenneth Raffa[2], [1]Univ. of Washington, Seattle, WA, [2]Univ. of Wisconsin, Madison, WI

1:45 **0858** From bacteria to biomes: Crossing scales toward a new understanding of eruptive population dynamics. **Allan L. Carroll** (allan.carroll@ubc.ca)[1], Brian Aukema[2], Barbara J. Bentz[3], Jeffrey A. Hicke[4], Monica Turner[5], William Romme[6] and Kenneth Raffa[5], [1]Canadian Forest Service, Victoria, BC, Canada, [2]Univ. of Minnesota, St. Paul, MN, [3]USDA - Forest Service, Logan, UT, [4]Univ. of Idaho, Moscow, ID, [5]Univ. of Wisconsin, Madison, WI, [6]Colorado State Univ., Fort Collins, CO

2:00 **0859** Architect, brick-layer, or design-builder? How to leave a legacy in forest entomology. **Richard L. Lindroth** (richard.lindroth@wisc.edu), Univ. of Wisconsin, Madison, WI

2:15 **0860** Ken's later years: Lessons learned from Ken Raffa's millennial graduate students. **Kimberly Wallin** (kwallin@uvm.edu), Univ. of Vermont, Burlington, VT

Member Symposium: Urban Pollinator Conservation: Overcoming Challenges in a Rapidly Changing Environment

Meeting Room 506 (Convention Center)

Moderators and Organizers: Bernadette Mach and Adam Baker, Univ. of Kentucky, Lexington, KY

1:00 **0861** Do cities' industrial pasts compromise their future conservation potential? **Frances S. Sivakoff** (sivakoff.3@osu.edu) and Mary Gardiner, The Ohio State Univ., Columbus, OH

1:15 **0862** Impact of light pollution on nocturnal Lepidoptera. **Kylee Grenis** (kgrenis@gmail.com)[1,2], Cesar Nufio[3], Gina M. Wimp[4] and Shannon Murphy[1], [1]Univ. of Denver, Denver, CO, [2]Tri-County Health Dept., Commerce City, CO, [3]Univ. of Colorado, Boulder, CO, [4]Georgetown Univ., Washington, DC

1:30 **0863** Developing monarch butterfly conservation methods for multipurpose landscapes. **Adam Baker** (adam.baker@uky.edu), Bernadette Mach, Timothy McNamara, Carl T. Redmond and Daniel Potter, Univ. of Kentucky, Lexington, KY

1:45 **0864** The value of outreach: Bringing pollinator conservation from research to large-scale impact. **Abiya Saeed** (abiyasaeed@gmail.com), Michigan State Univ. Extension, Flint, MI

2:00 **0865** Bee conservation in urban landscapes. **Jessica Kettenbach** (jaketten@ncsu.edu) and Rebecca E. Irwin, North Carolina State Univ., Raleigh, NC

2:15 **0866** Assessing woody ornamental plants for urban bee conservation. **Bernadette Mach** (bernadettemach@gmail.com), Adam Baker, Timothy McNamara, Carl T. Redmond and Daniel Potter, Univ. of Kentucky, Lexington, KY

2:30 **0867** Evaluating foraging preferences of pollinator species for commercial ornamental plant species. **Emily Erickson** (ere6@psu.edu)[1], Harland Patch[1], Sinclair Adams[2], Victoria Agatha Wojcik[3] and Christina M. Grozinger[1], [1]Pennsylvania State Univ., University Park, PA, [2]Pennsylvania State Univ., Lebanon, PA, [3]Univ. of California, Oakland, CA

2:45 **0868** The corporate garden: Industry perspective of supporting the creation of urban pollinator patches. **Stephanie Darnell** (stephanie.darnell@bayer.com), Bayer CropScience, Research Triangle Park, NC

Senior Member Symposium with Retired, Emeriti and ESA Professionals on Ignite Passion, Inspire Collaboration and Innovate Communications and Connections

Meeting Room 711 (Convention Center)

Moderators and Organizers: Kenneth A. Sorensen[1] and Sharlene Matten[2], [1]North Carolina State Univ., Raleigh, NC, [2]U.S. Environmental Protection Agency, Washington, DC

1:00 **Introductory Remarks**

1:05 **0869** An entomologist's life cycle and passion together with collaboration and connections on the biology and distribution of the buffalograss webworm, *Surattha indentella* Kearfott. **Kenneth A. Sorensen** (kenneth_sorensen@ncsu.edu), North Carolina State Univ., Raleigh, NC

1:20 **0870** Ignite the transition from academia to government and the passion of EPA. **Sharlene Matten** (matten.sharlene@epa.gov), U.S. Environmental Protection Agency, Washington, DC

1:35 **0871** What I have learned about mentoring as a student, teacher, professor, administrator, and lawyer. **Lawrence Matten** (lcmatten@gmail.com), Southern Illinois Univ., Carbondale, IL

1:50 **0872** How senior entomologists can be involved in the Annual Meeting: Organization and the coming together of a large event. **Robert L. Meagher** (rob.meagher@ars.usda.gov), USDA - ARS, Gainesville, FL

2:20 **Welcome discussion on the collaboration and connection of systematics and taxonomy within ESA and USA**

2:30 **Open discussion, business session and ESA senior member symposium in Vancouver (2018 Theme)**

2:40 **Concluding Remarks**

Lightning Bug (3-min): All Sections

Four Seasons Ballroom (Convention Center)

Moderators and Organizers: Wendy Johnson[1] and Susan Weller[2], [1]Kansas State Univ., Manhattan, KS, [2]Univ. of Nebraska, Lincoln, NE

Due to the rapid speed of delivery, specific times are not listed for individual talks in this section. Each talk will be limited to a total of 3 minutes; talks will be given in sequential order as listed below starting at 1:00 PM with no pauses for no-show presenters.

1:00 PM – 3:00 PM

0873 Isoclast™ Active: A selective insecticide for management of soybean aphid. **Melissa Willrich Siebert** (mwillrichsiebert@dow.com)[1], Patricia Prasifka[2] and Dave Ruen[3], [1]Dow AgroSciences, Greenville, MS, [2]Dow AgroSciences, West Fargo, ND, [3]Dow AgroSciences, Lanesboro, MN

0874 A geospatial visualization tool to assess Zika virus transmission risk under alternative scenarios. **Russ Jones** (russ_jones@abtassoc.com), Michelle Krasnec, Ryan Takeshita, Claire Lay and Josh Lipton, Abt Associates, Boulder, CO

0875 Males matter: The seminal secrets of *Culex pipiens*. **Robin Bautista Jimenez** (bautista-jimenez.1@osu.edu) and Megan E. Meuti, The Ohio State Univ., Columbus, OH

0876 Genetics of cuticular hydrocarbon evolution in *Drosophila*. **Henry Chung** (hwchung@msu.edu), Michigan State Univ., East Lansing, MI

0877 Entomology under glass: A short IPM success story. **Ryan Gott** (ryan.c.gott@gmail.com), Phipps Conservatory and Botanical Gardens, Pittsburgh, PA

0878 Perennial conservation habitat at center-pivot irrigation corners enhances predation in adjacent corn fields. Kayla A. Mollet[1], Débora Montezano[1] and **Julie Peterson** (julie.peterson@unl.edu)[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, North Platte, NE

0879 Investigating ornamental plant resources utilized by bee species in urban settings. **Natalia Bjorklund** (natalia.bjorklund@unl.edu), Judy Wu-Smart and Thomas Weissling, Univ. of Nebraska, Lincoln, NE

0880 Monitoring a biological control agent in an ephemeral and heavily managed ecosystem. **Ashley Goode** (ashley.goode@ars.usda.gov), USDA - ARS, Fort Lauderdale, FL

0881 Local environment influence on the dispersal and genetic structure of cockroaches and microbes. **Xueyang Fan** (xf24@njit.edu), New Jersey Institute of Technology, Newark, NJ

0882 Potential for biotic interference between *L. lilii* biocontrol parasitoids and *L. cheni*, a weed biocontrol agent. **Lisa Tewksbury** (lisat@uri.edu)[1], Ellen Lake[2], Tania Santos[1], Miles Martin[1], Richard Casagrande[1], Melissa Smith[2] and F. Dray Jr.[2], [1]Univ. of Rhode Island, Kingston, RI, [2]USDA - ARS, Fort Lauderdale, FL

0883 Large-scale thinnings mitigate *Dendroctonus ponderosae*-caused tree mortality. **Jose F. Negron** (jnegron@fs.fed.us)[1], Kurt Allen[2], Angie Ambourn[3], Blaine Cook[4] and Kenneth Marchand[4], [1]USDA - Forest Service, Fort Collins, CO, [2]USDA - Forest Service, Rapid City, SD, [3]Minnesota Dept. of Agriculture, St. Paul, MN, [4]USDA - Forest Service, Custer, SD

0884 Dynamics influencing farm-scape distribution and abundance of the brown marmorated stink bug in Mid-Atlantic apple orchards. **Whitney Hadden** (wthadden@vt.edu)[1], Christopher Bergh[2] and Tracy C. Leskey[3], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Virginia Polytechnic Institute and State Univ., Winchester, VA, [3]USDA - ARS, Kearneysville, WV

0885 Metapopulations: From bacteria to elephants. **Ernest Delfosse** (delfosse@cns.msu.edu), Michigan State Univ., East Lansing, MI

0886 How come *Ips typographus* (European spruce bark beetle) is so cool that we got a 6-year project for its control "From gene to landscape level"? **Fredrik Schlyter** (fredrik.schlyter@slu.se), Czech Univ. of Life Sciences, Prague, Czech Republic

0887 Detection of cryptic tree-boring insects in Arboreta in Boston, New York City and Washington, DC. **Michael Bohne** (mbohne@fs.fed.us)[1], Marc DiGirolomo[1], Kasey Maria Yturralde[2], Andrew Gapinski[3], Joseph Charap[4], Kevin J. Dodds[1] and John DelRosso[3], [1]USDA - Forest Service, Durham, NH, [2]Portland Parks and Recreation, Portland, OR, [3]The Arnold Arboretum of Harvard Univ., Boston, MA, [4]Green-Wood, Brooklyn, NY

0888 Survey for an unidentified flatheaded borer (Coleoptera: Buprestidae) in Florida blueberries. **Lindsy Iglesias** (liglesias@ufl.edu), Janine Spies, Elena Rhodes and Oscar Liburd, Univ. of Florida, Gainesville, FL

0889 Presentation withdrawn

0890 Splat bloom: A semiochemical solution for more effective pollination of honey-bee dependent crops. **Jesse Saroli** (jesse.saroli@iscatech.com)[1], Agenor Mafra-Neto[1], Michael Seagraves[2], Jimmy Klick[3], Rafael Borges[4], Rodrigo Silva[1], William Urrutia[1] and Carmem Bernardi[1], [1]ISCA Technologies, Inc, Riverside, CA, [2]Driscoll's Strawberry Associates, Inc, Watsonville, CA, [3]Oregon State Univ., Corvallis, OR, [4]ISCA Tecnologias Ltda, Ijui, Brazil

0891 Semiochemical repellent strategies for South America palm weevil (*Rhynchophorus palmarum*) and other beetle pests. **Rodrigo Silva** (rodrigo.silva@iscatech.com)[1], Francisco Zorzenon[2], Agenor Mafra-Neto[1], William Urrutia[1], Jesse Saroli[1] and Carmem Bernardi[1], [1]ISCA Technologies, Inc, Riverside, CA, [2]Instituto Biologico, São Paulo, Brazil

0892 Hook RPW: A trap-free attract and kill technology for the red palm weevil, *Rhynchophorus ferrugineus*. **William Urrutia** (william.urrutia@iscatech.com)[1], J. R. Faleiro[2], Abdallah Ben Abdallah[3], Rodrigo Silva[1], Carmem Bernardi[1], Jesse Saroli[1] and Agenor Mafra-Neto[1], [1]ISCA Technologies, Inc, Riverside, CA, [2]Ministry of Agriculture, Al-Hassa, Saudi Arabia, [3]Food and Agriculture Organization Project, Al Hassa, Saudi Arabia

0893 Launching the Global Locust Initiative: An organization to link researchers, governmental and non-governmental agencies, and farming communities to address and mitigate the effects of locust plagues. **Arianne Cease** (acease@asu.edu) and Ariel Rivers, Arizona State Univ., Tempe, AZ

0894 A comparison of insect herbivory on leaves of native and non-native rose and honeysuckle, as a test of the enemy release hypothesis. **Ellen Yerger** (ellen.yerger@iup.edu), Jeannie Showers and H. Edward Donley, Indiana Univ. of Pennsylvania, Indiana, PA

0895 Fire or flood: Which has a greater effect on tadpole shrimp (Triops longicaudatus)? **Joanna Bloese** (jbbloese@ucdavis.edu)[1], Luis Espino[2], Kevin Goding[1] and Larry Godfrey[1], [1]Univ. of California, Davis, CA, [2]Univ. of California Cooperative Extension, Colusa, CA

0896 Management of a sucking pest in Mid-Atlantic cotton: The tarnished plant bug (*Lygus lineolaris*). **Seth Dorman** (sjdorman@vt.edu) and Sally Taylor, Virginia Polytechnic Institute and State Univ., Suffolk, VA

0897 The evolution of IPM in ag and food sustainability initiatives. **Thomas Green** (ipmworks@ipminstitute.org)[1] and Curtis Petzoldt[2], [1]IPM Institute of North America, Madison, WI, [2]Cornell Univ., Geneva, NY

0898 Hornworm developental variation on *Solanum* and multiple species of *Jaltomata*. **Alicia Bray** (brayalic@gmail.com), Danielle Strzalkowski and Thomas Mione, Central Connecticut State Univ., New Britain, CT

0899 Sustainable landscape solutions to reduce pesticide exposure and promote establishment of beneficial insect and pollinator communities in agricultural areas. **Surabhi Vakil** (guptasurbhi8a@gmail.com), Thomas Weissling and Judy Wu-Smart, Univ. of Nebraska, Lincoln, NE

0900 Interspecific competition and temporal resource partitioning facilitate speciation. **Glen Hood** (glenrayhood@gmail.com)[1], Thomas Powell[2], Andrew Forbes[3], Scott Egan[1], Alice Harada[4] and Jeffrey Feder[5], [1]Rice Univ., Houston, TX, [2]State Univ. of New York, Binghamton, NY, [3]Univ. of Iowa, Iowa City, IA, [4]Univ. of California, San Diego, CA, [5]Univ. of Notre Dame, Notre Dame, IN

0901 Micro-scoop: A little info on how to talk to the press. **Liz Langley** (langley.liz@gmail.com), Freelancer at National Geographic, Orlando, FL

0902 Using Chalcidoidea (Hymenoptera) as a teaching tool for biodiversity. **Ryan Perry** (rperr003@ucr.edu), Univ. of California, Riverside, CA

0903 Macronutrient regulation and foraging strategies in the Neotropical ant *Ectatomma ruidum*. **Andrew Burchill** (andrew.burchill@asu.edu), Arizona State Univ., Tempe, AZ

0904 The importance of female promiscuity and sperm precedence in the evolution of reproductive barriers in leaf beetles. **Erica Larson** (ericalarson@gmail.com)[1] and Merrill A. Peterson[2], [1]Univ. of Denver, Denver, CO, [2]Western Washington Univ., Bellingham, WA

0905 Interannual patterns and drivers of dispersal in aquatic beetles. **Matthew Pintar** (matthew.pintar@gmail.com) and William Resetarits, Univ. of Mississippi, University, MS

10-min: SysEB, Biology, Morphology and Systematics of Mites and Spiders

Meeting Room 402 (Convention Center)

Moderator: Tobiasz Druciarek, Univ. of Arkansas, Fayetteville, AR

1:00 **0906** *Phyllocoptes* (Acari: Eriophyoidea) from rose: How many species? **Tobiasz Druciarek** (tzdrucia@uark.edu)[1], Mariusz Lewandowski[2] and Ioannis Tzanetakis[1], [1]Univ. of Arkansas, Fayetteville, AR, [2]Warsaw Univ. of Life Sciences, Warsaw, Poland

1:10 **0907** Association of larvae and post-larval instars of Parasitengona (Acariformes) mites using DNA barcoding. **Samuel Costa** (samuelgere@bol.com.br)[1], Leopoldo Bernardi[2], Luciana Gonçalves[1], Leonardo Quaresma[1] and Almir Pepato[1], [1]Univ. Federal de Minas Gerais, Belo Horizonte, Brazil, [2]Univ. Federal de Lavras, Lavras, Brazil

1:20 **0908** A new species of *Terminalichus* (Acari: Tenuipalpidae) from Thailand, with a key to the known species. **Elizeu B. Castro** (elizeu_unesp@yahoo.com.br)[1,2], Ronald Ochoa[3] and Reinaldo J. F. Feres[1], [1]Univ. Estadual Paulista, São José do Rio Preto, Brazil, [2]Smithsonian Institution, Washington, DC, [3]USDA - ARS, Beltsville, MD

1:30 **0909** Tarsonemid mites (Prostigmata: Tarsonemidae) under the LT-SEM (Low Temperature Scanning Electron Microscopy): A new interpretation of the morphology. **Jose Rezende** (jmrezende@live.com)[1], Gary R. Bauchan[2], Antonio Lofego[3], Cal Welbourn[4] and Ronald Ochoa[2], [1]Univ. Estadual Paulista, São Paulo, Brazil, [2]USDA - ARS, Beltsville, MD, [3]Univ. Estadual Paulista, São José do Rio Preto, Brazil, [4]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

1:40 **0910** Poultry manure-inhabiting mites (Acari: Mesostigmata: Laelapidae) with new records and species from Pakistan. **Muhammad Qayyoum** (asifqayyoum@gmail.com) and Bilal Khan, Univ. of Agriculture, Faisalabad, Pakistan

1:50 **0911** Understanding the wheat curl mite complex: Genetic variation, host specificity, and ability to transmit *Wheat streak mosaic virus*. **Wiktoria Szydlo** (wszydlo2@unl.edu)[1], Gary Hein[1] and Anna Skoracka[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Adam Mickiewicz Univ., Poznan, Poland

2:00 **0912** Egg toxicity in diverse spider taxa. **Justin Schmidt** (ponerine@dakotacom.net)[1], Richard Vetter[2] and Amanda Howe[3], [1]Southwestern Biological Institute, Tucson, AZ, [2]Univ. of California, Riverside, CA, [3]Southwestern Biological Institute, Enumclaw, WA

2:10 **0913** Tales from the web: Diverse bacterial symbiont infections in a linyphiid spider. **Jennifer A. White** (jenawhite@uky.edu), Alex Styer and Laura Rosenwald, Univ. of Kentucky, Lexington, KY

2:20 **0914** Collective composition of hunting strategies in a tallgrass spider community is modulated by disturbances from fire and grazing. **Jesus Gomez** (jesuslobo06@gmail.com) and Anthony Joern, Kansas State Univ., Manhattan, KS

10-min: SysEB, Evolution and Morphology of Lepidoptera

Meeting Room 303 (Convention Center)

Moderator: Paul Goldstein, USDA - ARS, Washington, DC

1:00 **0915** Diversity and diet of Neotropical fern-feeding genera in the Noctuidae (Lepidoptera). **Paul Goldstein** (paul.goldstein@ars.usda.gov)[1], Dan Janzen[2] and Winnie Hallwachs[2], [1]USDA - ARS, Washington, DC, [2]Univ. of Pennsylvania, Philadelphia, PA

1:10 **0916** Geographic patterns in species richness and range limits of the genus *Catasticta* Butler, 1870. **Pablo Padron** (sebastianpadronm@yahoo.com)[1] and Keith R. Willmott[2], [1]Univ. del Azuay, Cuenca, Ecuador, [2]Univ. of Florida, Gainesville, FL

1:20 **0917** Review of the West Indian *Astraptes xagua* (Lucas) complex (Hesperiidae: Eudaminae) and a new subspecies. **Jacqueline Miller** (jmiller@flmnh.ufl.edu)[1] and Nick Grishin[2], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Texas Southwestern Medical Center, Dallas, TX

1:30 **0918** Does a genomic approach reveal genetic diversity suggested by ecological and morphological divergence in a widespread charismatic buckmoth (*Hemileuca maia*)? **Daniel Rubinoff** (rubinoff@hawaii.edu)[1], Michael San Jose[1], Julian Dupuis[2], Sheina Sim[1], Scott Geib[2] and Richard Peigler[3], [1]Univ. of Hawai'i, Honolulu, HI, [2]USDA - ARS, Hilo, HI, [3]Univ. of the Incarnate Word, San Antonio, TX

1:40 **0919** Modeling male Gelechiidae genitalia. **Mark Metz** (mark.metz@ars.usda.gov), USDA - ARS, Washington, DC

1:50 **0920** The role of antagonism in specialization of the yucca-yucca moth brood pollination mutualism. **David Althoff** (dmalthof@syr.edu) and Kari Segraves, Syracuse Univ., Syracuse, NY

2:00 **0921** Linking *Helicoverpa zea* reproductive virus to sterile field collected *H. zea* males using ddPCR. **Luke Tembrock** (tembrock@colostate.edu)[1], Frida Zink[1], John Burand[2], Alicia Timm[1] and Todd Gilligan[3], [1]Colorado State Univ., Fort Collins, CO, [2]Univ. of Massachusetts, Amherst, MA, [3]USDA - APHIS, Fort Collins, CO

2:10 **0922** Population density and nutrient limitation influence on mate choice and reproductive traits in the Mediterranean flour moth, *Ephestia kuehniella* Zeller. **Santhi Bhavanam** (b.s.priya@massey.ac.nz) and Steve Trewick, Massey Univ., Palmerston North, New Zealand

2:20 **0923** A Droplet Digital PCR (ddPCR) assay to detect *Helicoverpa armigera* (Lepidoptera: Noctuidae) in bulk trap samples. **Frida Zink** (frida.zink@colostate.edu)[1], Luke Tembrock[1], Alicia Timm[1], Roxanne Farris[2], Omaththage Perera[3] and Todd Gilligan[4], [1]Colorado State Univ., Fort Collins, CO, [2]USDA - APHIS, Edinburg, TX, [3]USDA - ARS, Stoneville, MS, [4]USDA - APHIS, Fort Collins, CO

10-min: SysEB, Genomics and Population Genetics

Meeting Room 403 (Convention Center)

Moderator: Gerald Bermond, Illinois Institute of Technology, Chicago, IL

1:00 **0924** Presentation withdrawn

1:10 **0925** Re-wiring of segmentation gene regulatory network during insect evolution. **Leslie Pick** (lpick@umd.edu), Jie Xiang, Katie Reding, Mengyao Chen, Faith Kung, Patricia Graham and Alys Jarvela, Univ. of Maryland, College Park, MD

1:20 **0926** Whole genome resequencing sheds light on the evolutionary history and rapid evolution of a superpest, the Colorado potato beetle, *Leptinotarsa decemlineata*. **Benjamin Pelissie** (benjamin.pelissie@icloud.com)[1], Yolanda Chen[2], David J. Hawthorne[3] and Sean Schoville[1], [1]Univ. of Wisconsin, Madison, WI, [2]Univ. of Vermont, Burlington, VT, [3]Univ. of Maryland, College Park, MD

1:30 **0927** Evolution and function of RHS Proteins in *Aedes*, *Cimex*, and *Wolbachia*. **Jonas G. King** (jonas.king@msstate.edu), Lily Brooks and Aline Bronzato, Mississippi State Univ., Mississippi State, MS

1:40 **0928** A 28S rRNA D2-D3 expansion variant useful in molecular identification of the apple maggot, *Rhagoletis pomonella* and the snowberry fly, *R. zephyria*. **James Smith** (jimsmith@msu.edu)[1], Daniel Hulbert[1], Mike Klaus[2] and Guy Bush[3], [1]Michigan State Univ., East Lansing, MI, [2]Washington State Dept. of Agriculture, Yakima, WA, [3]Michigan State Univ., Fish Creek, WI

1:50 **0929** A real-time PCR assay for the separation of *Autographa gamma* (Noctuidae: Plusiinae) from morphologically similar species in North America. **Todd Gilligan** (todd.m.gilligan@aphis.usda.gov)[1], Luke Tembrock[2], Roxanne Farris[3], Lisa A. Ledezma[3] and Norman Barr[3], [1]USDA - APHIS, Fort Collins, CO, [2]Colorado State Univ., Fort Collins, CO, [3]USDA - APHIS, Edinburg, TX

2:00 **Break**

2:10 **0930** Rapid adaptive evolution drives population size and invasion speed. Marianna Szucs[1], Megan Vahsen[1], Christopher Weiss-Lehman[2], Brett Melbourne[3] and **Ruth Hufbauer** (hufbauer@colostate.edu)[1], [1]Colorado State Univ., Fort Collins, CO, [2]Univ. of Minnesota, St. Paul, MN, [3]Univ. of Colorado, Boulder, CO

2:20 **0931** Effective population sizes of lab-reared corn rootworm colonies. **Gerald Bermond** (gbermond@iit.edu), Illinois Institute of Technology, Chicago, IL

2:30 **0932** On babies and bathwater: Alternative filtering approach reveals functional and paralogous genomic linkage blocks in a SNP array for mountain pine beetle (*Dendroctonus ponderosae*). Stephen Trevoy[1], Jasmine Janes[2], Kevin Muirhead[1] and **Felix Sperling** (felix.sperling@ualberta.ca)[1], [1]Univ. of Alberta, Edmonton, AB, Canada, [2]Univ. of New England, Armidale, Australia

2:40 **0933** Genetic integrity of cryptic *Euwallacea* spp. in a Taiwanese avocado orchard. **Paul F. Rugman-Jones** (paulrj@ucr.edu), Deena Husein, Akif Eskalen and Richard Stouthamer, Univ. of California, Riverside, CA

2:50 **0934** PCR validation of glycoside hydrolase families 43 and 44 coding for putative plant cell wall degrading enzymes in the emerald ash borer (*Agrilus planipennis*) genome. **Peyton J. Murin** (pjmurin@memphis.edu)[1], Cristian Beza-Beza[1], Erin Scully[2], Duane D. McKenna[1] and Jian Duan[3], [1]Univ. of Memphis, Memphis, TN, [2]USDA - ARS, Manhattan, KS, [3]USDA - ARS, Newark, DE

3:00 **0935** Some molecular studies for the detection of parasitism by ectoparasitoid *Tamaraxia radiata* (Waterson) (Hymenoptera: Eulophidae) from citrus field collected population of its host *Diaphorina citri* Kuwayama (Hemiptera: Psyllidae) in Faisalabad, Pakistan. **Zain Ul Abdin** (zainentomology@uaf.edu.pk), Muhammad Rashid, Sohail Ahmed, Fiaz Hussain and Rao Sohail Amad Khan, Univ. of Agriculture, Faisalabad, Pakistan

10-min: SysEB, Phylogeny and Evolution of Hymenoptera

Meeting Room 507 (Convention Center)

Moderator: Andrew Bennett, Agriculture and AgriFood Canada, Ottawa, ON, Canada

1:00 **0936** Effects of host feeding on life traits of *Tamarixia radiata* (Hymenoptera: Eulophidae): Implications for biological control of the Asian citrus psyllid. Marco Gebiola, **Francesc Gomez Marco** (francesc.g.marco@gmail.com) and Richard Stouthamer, Univ. of California, Riverside, CA

1:10 **0937** Foraging efficiency patterns of two parasitoid wasps that compete for the same host. **Dhaval Vyas** (dhaval.vyas@colostate.edu), Ryan Paul and Paul Ode, Colorado State Univ., Fort Collins, CO

1:20 **0938** Presentation withdrawn

1:30 **0939** Checklists of the Hymenoptera of Canada, Alaska and Greenland: Comparisons in time, space, and taxon. **Andrew M. R. Bennett** (andrew.bennett@agr.gc.ca), Agriculture and AgriFood Canada, Ottawa, ON, Canada

1:40 **0940** Mission impossible? Phylogenomic approaches to resolving the phylogeny of Chalcidoidea (Hymenoptera), a recent megaradiation of wasps. **Junxia Zhang** (jxzhang1976@gmail.com)[1], John M. Heraty[1], Roger A. Burks[1], Ralph Peters[2], Alan Lemmon[3], Emily Lemmon[3], Keith Hopper[4], Jack Werren[5] and Ellen Martinson[5], [1]Univ. of California, Riverside, CA, [2]Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany, [3]Florida State Univ., Tallahassee, FL, [4]USDA - ARS, Newark, DE, [5]Univ. of Rochester, Rochester, NY

1:50 **0941** Presentation withdrawn

2:00 **0942** UCEs offer clarity in the systematics of the oak gall wasps (Cynipini). **Crystal Cooke** (cookeidae@gmail.com)[1], Graham Stone[2], James Nicholls[2] and Charles Mitter[1], [1]Univ. of Maryland, College Park, MD, [2]Univ. of Edinburgh, Edinburgh, Scotland

2:10 **0943** Origins and antiquity of pollen-feeding in the vespid wasps, based on phylogenomic analysis of ultraconserved elements. **Elizabeth Murray** (em573@cornell.edu)[1], Silas Bossert[1], Bonnie Blaimer[2] and Bryan N. Danforth[1], [1]Cornell Univ., Ithaca, NY, [2]Smithsonian Institution, Washington, DC

10-min: SysEB, Systematics and Biodiversity of the Odonata and Polyneoptera

Meeting Room 401 (Convention Center)

Moderator: Melissa Sánchez Herrera, Rutgers, The State Univ. of New Jersey, Newark, NJ

1:00 **0944** Delineating the global invasion history of *Reticulitermes flavipes* using single-nucleotide polymorphism. **Laura Johnson** (laura.nlj@gmail.com)[1], Edward Vargo[1], Elfie Perdereau[2], Franck Dedeine[3] and Anne-Geneviève Bagnères[2], [1]Texas A&M Univ., College Station, TX, [2]Univ. de Tours, Tours, France, [3]National Center for Scientific Research, Tours, France

1:10 **0945** Incomplete cocladogenesis between *Zootermopsis* termites and their parabasalid symbionts. **Stephen Taerum** (staerum@asu.edu) and Gillian Gile, Arizona State Univ., Tempe, AZ

1:20 **0946** Life at 40X - The comparison of Eastern vs. Western subterranean termite endosymbionts. **Erin McHale** (emm308@scarletmail.rutgers.edu), Rutgers, The State Univ. of New Jersey, South Amboy, NJ

1:30 **0947** A biogeographical story of the Neotropical banner wing damselflies (Zygoptera: Polythoridae). **Melissa Sánchez Herrera** (melsanc@gmail.com)[1], Christopher Beatty[2], Camilo Salazar[3], Renato Nunes[1] and Jessica Ware[4], [1]Rutgers, The State Univ. of New Jersey, Newark, NJ, [2]Cornell Univ., Ithaca, NY, [3]Univ. del Rosario, Bogotá, Colombia, [4]American Museum of Natural History, New York, NY

1:40 **0948** Biogeography and systematics of endemic island damselflies: The *Nesobasis* and *Melanesobasis* (Odonata: Zygoptera) of Fiji. **Christopher Beatty** (beattych@yahoo.com)[1], Melissa Sánchez Herrera[2], Jeffrey Skevington[3], Arash Rashed[4], Hans Van Gossum[5], Scott Kelso[3] and Thomas Sherratt[6], [1]Cornell Univ., Ithaca, NY, [2]Rutgers, The State Univ. of New Jersey, Newark, NJ, [3]Agriculture and Agri-Food Canada, Ottawa, ON, Canada, [4]Univ. of Idaho, Aberdeen, ID, [5]Univ. of Antwerp, Antwerp, Belgium, [6]Carleton Univ., Ottawa, ON, Canada

1:50 **0949** Presentation withdrawn

2:00 **Break**

2:10 **0950** A new species of the genus *Andiperla* (Plecoptera, Gripopterygidae) from the glaciers of southern Patagonia and observations on its biology and genome. Pablo Pessacq[1], Javier Muzon[2], Daniel Bea[3], Ramiro Tintorelli[3], Ronald Kühnlein[4] and **Rolando Rivera-Pomar** (rrivera@unnoba.edu.ar)[3], [1]Laboratorio de Investigaciones en Ecologia y Sistematica Animal, Chubut, Argentina, [2]Univ. Nacional de Avellaneda, Avellaneda, Argentina, [3]Univ. Nacional del Noroeste de Buenos Aires, Pergamino, Argentina, [4]Karl-Franzens-Univ., Graz, Austria

2:20 **0951** A global cross-kingdom convergence: Myrmecochory in angiosperms and stick insects. **James Robertson** (erotylid@gmail.com)[1], Sven Bradler[2] and Michael F. Whiting[3], [1]Univ. of Arizona, Tucson, AZ, [2]Georg-August-Univ., Göttingen, Germany, [3]Brigham Young Univ., Provo, UT

2:30 **0952** Standardization of praying mantis morphology, nomenclature, and practices (Insecta, Mantodea). **Sydney Brannoch** (sbrannoch@case.edu)[1], Frank Wieland[2], Julio Rivera[3], Klaus-Dieter Klass[4], Olivier Bethoux[5] and Gavin J. Svenson[1], [1]Cleveland Museum of Natural History, Cleveland, OH, [2]Pfalzmuseum für Naturkunde, Bad Dürkheim, Germany, [3]Univ. San Ignacio de Loyola, La Molina, Peru, [4]Senckenberg Natural History Collections, Dresden, Germany, [5]Muséum National d'Histoire Naturelle, Paris, France

2:40 **0953** Higher-level systematics of Neotropical Mantidae (Mantodea). **Henrique Rodrigues** (hmrbio@gmail.com)[1] and Gavin J. Svenson[2], [1]Case Western Reserve Univ., Cleveland, OH, [2]Cleveland Museum of Natural History, Cleveland, OH

2:50 **0954** A Cretaceous aged dispersal established an endemic lineage of Caribbean praying mantises. **Gavin J. Svenson** (gsvenson@cmnh.org), Cleveland Museum of Natural History, Cleveland, OH

10-min: SysEB, Systematics, Biodiversity and Genomics of Diptera

Meeting Room 304 (Convention Center)

Moderator: Camiel Doorenweerd, Naturalis Biodiversity Center, Leiden, Netherlands

1:00 **0955** Systematics of the genus *Tephritis* (Diptera: Tephritidae) of the Old and New World: Current progress and perspectives. **Severyn Korneyev** (s.v.korneyev@gmail.com), I. I. Schmalhausen Institute of Zoology, Kyiv, Ukraine

1:10 **0956** Fossils to genomes: Diverse data to decipher assassin fly evolution (Diptera: Asilidae). **Torsten Dikow** (dikowt@si.edu), Rebecca Dikow, Paul Frandsen and Mauren Turcatel, Smithsonian Institution, Washington, DC

1:20 **0957** Flower fly (Diptera: Syrphidae) phylogenetics in a next-gen world: What will be learned in a post-data paradigm? **Andrew Young** (adyoung@gmail.com)[1], Kevin Moran[2], Jeffrey Skevington[1], Trevor Burt[3], Ximo Mengual[3], Gunilla Ståhls[4], Kurt Jordaens[5], Scott Kelso[1], Hannah Norman[6], Alfried Vogler[7], Sander Bot[8], Menno Reemer[9], Martin Hauser[10], Menno van Zuijen[11], Jeroen van Steenis[12], Axel Ssymank[13], Wouter van Steenis[12], Gil Miranda[14], Chris Palmer[15], Maarten de Groot[16] and F. Thompson[17], [1]Agriculture and Agri-Food Canada, Ottawa, ON, Canada, [2]Carleton Univ., Ottawa, ON, Canada, [3]Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany, [4]Finnish Museum of Natural History, Helsinki, Finland, [5]Royal Museum for Central Africa, Tervuren, Belgium, [6]Imperial College of London, London, United Kingdom, [7]Natural History Museum, London, United Kingdom, [8]Holland, Netherlands, [9]Naturalis Biodiversity Center, Leiden, Netherlands, [10]California Dept. of Food and Agriculture, Sacramento, CA, [11]Wageningen, Netherlands, [12]Naturalis Biodiversity Center, Breukelen, Netherlands, [13]Federal Agency for Natural Conservation, Bonn, Germany, [14]Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil, [15]United Kingdom, [16]Slovenian Forestry Insitute, Ljubljana, Slovenia, [17]American Entomological Society, Ponte Vedra, FL

1:30 **0958** A genetic approach for describing new species of cryptic Dacini fruit flies. **Camiel Doorenweerd** (camiel.doorenweerd@hawaii.edu)[1], Michael San Jose[1], Luc Leblanc[2] and Daniel Rubinoff[1], [1]Univ. of Hawai'i, Honolulu, HI, [2]Univ. of Idaho, Moscow, ID

1:40 **0959** Brachyceran flies grazing liverworts: Morphological evolution of larval mouthparts accompanied with diet shifts. **Yume Imada** (imayume.ac@gmail.com)[1,2] and Makoto Kato[2], [1]Smithsonian Institution, Washington, DC, [2]Kyoto Univ., Kyoto, Japan

1:50 **0960** Biodiversity and species composition of saprophagous hoverflies of sub-family Eristalinae in Thatta, Sindh, Pakistan. Atta Ansari, Nasreen Memon, **Mansoor Shah** (lakyari@hotmail.om), Aiman Amur and Juma Turk, Univ. of Sindh, Jamshoro, Pakistan

2:00 **0961** Presentation withdrawn

2:10 **0962** Where you come from and where you are: The interaction of developmental and adult social environments on sexual selection in *Drosophila melanogaster*. **Juliano Morimoto** (juliano.morimoto@mq.edu.au)[1,2] and Stuart Wigby[3], [1]Macquarie Univ., Sydney, Australia, [2]Programa de Pos-graduação em Ecologia e Conservação, Curitiba, Brazil, [3]Univ. of Oxford, Oxford, United Kingdom

Organized Meeting: Highlights of Medical, Urban and Veterinary Entomology & MUVE Business Meeting

Meeting Room 702/704/706 (Convention Center)

Moderator and Organizer: Alec Gerry, Univ. of California, Riverside, CA

1:30 **Welcoming Remarks**

1:35 **0963** Highlights in veterinary entomology. **Justin Talley** (justin.talley@okstate.edu), Oklahoma State Univ., Stillwater, OK

2:20 **0964** Highlights in medical entomology. **Roberto Barrera** (amz9@cdc.gov), Centers for Disease Control and Prevention, San Juan, PR

3:05 **0965** Highlights in urban entomology. **Chow-Yang Lee** (chowyang@usm.my), Universiti Sains Malaysia, Penang, Malaysia

3:50 **MUVE Reception**

4:20 **Preliminary Business Meeting**

Organized Meeting: Physiology, Biochemistry, and Toxicology (PBT) Networking Section

Meeting Room 302 (Convention Center)

Moderators and Organizers: Peter Jensen[1] and Blair Siegfried[2], [1]Monsanto Company, St. Louis, MO, [2]Univ. of Florida, Gainesville, FL

3:00 **Open and welcome**

3:05 **PBT representatives and volunteer recognition, award winners**

3:20 **PBT Section initiatives**

3:35 **Solicit nominations for open positions or initiative volunteers**

3:40 **0966** Presentation from the recipient of the 2017 Lillian and Alex Feir Graduate Student Travel Award in Insect Physiology, Biochemistry, or Molecular Biology: The genetic and mechanistic basis of worker sterility in the honey bee. **Isobel Ronai** (isobel.ronai@sydney.edu.au), Univ. of Sydney, Sydney, Australia

3:55 **Governing Board report**

4:00 **Treasurer's report**

4:05 **Science Policy Fellows report**

4:10 **0967** Presentation from the recipient of the 2017 ESA Early Career Innovation Award: Dehydration alters the behavior and physiology of disease vectors. **Joshua Benoit** (joshua.benoit@uc.edu), Univ. of Cincinnati, Cincinnati, OH

4:25 **Networking Session**

Organized Meeting: Plant-Insect Ecosystem (P-IE) Section Networking, Business, and Learning Session

Meeting Room 501/502/503/504 (Convention Center)

Moderators and Organizers: Melissa Willrich Siebert[1] and Mark Wright[2], [1]Dow AgroSciences, Greenville, MS, [2]Univ. of Hawai'i, Honolulu, HI

3:00 **P-IE Section Business Meeting and Awards**

4:00 **P-IE Section Pollinator Video Contest**

4:20 **2017 Science Policy Field Tour Recap**

4:35 **An ESA Grand Challenge, "Sustainable Agriculture": What is sustainable agriculture and current examples**

4:40 **0968** The role of integrated pest management in sustaining agriculture. **Peter Goodell** (pbgoodell@ucanr.edu), Univ. of California, Parlier, CA

5:00 **0969** Perspectives on the role of habitat management in sustainable agriculture. **Zsofia Szendrei** (szendrei@msu.edu), Michigan State Univ., East Lansing, MI

5:20 **Panel Discussion**

5:30 **Member Networking and Refreshments**

Organized Meeting: Systematics, Evolution, and Biodiversity (SysEB) Section Meeting

Meeting Room 708/710/712 (Convention Center)

Moderators and Organizers: Christopher Beatty[1] and Andrew Short[2], [1]Cornell Univ., Ithaca, NY, [2]Univ. of Kansas, Lawrence, KS

3:00 **Welcome Reception**

3:30 **Introductory Remarks**

3:40 **SysEB Student Research Travel Awards**

3:45 **0970** Presentation by the recipient of the 2017 Snodgrass Memorial Research Award: The comparative morphology of wing pattern in Lepidoptera. **Sandra Schachat** (schachatsr@si.edu), Smithsonian Institution, Washington, DC

4:00 **NSF reports**

4:30 **Committee reports**

4:55 **Break**

5:00 **0971** SysEB Invited Presentation: Butterflies as models for understanding the evolution of color vision and coloration in insects. **Adriana D. Briscoe** (abriscoe@uci.edu), Univ. of California, Irvine, CA

NOTES:

Tuesday, November 7, 2017 • POSTERS

Poster: MUVE, Insecticides and Other Control

Mile High Ballroom (Convention Center)

D3236 Virulence of entomopathogenic bacteria in the bed bug, *Cimex lectularius*. **Jose Pietri** (jose@apexbait.com) and Dangsheng Liang, Apex Bait Technologies, Inc, Santa Clara, CA

D3237 Susceptibility of house flies and their parasitoids to pyriproxyfen in the U.S. and Israel. **Christopher Geden** (chris.geden@ars.usda.gov)[1], Elad Chiel[2] and Haim Biale[3], [1]USDA - ARS, Gainesville, FL, [2]Univ. of Haifa, Tivon, Israel, [3]Univ. of Haifa-Oranim, Haifa, Israel

D3238 Field demonstration using Siesta to manage fire ants, *Solenopsis invicta* Buren (Hymenoptera: Formicidae), in Kenner, Louisiana. **Dennis R. Ring** (dring@agctr.lsu.edu)[1] and Bob Davis[2], [1]Louisiana State Univ., Baton Rouge, LA, [2]BASF Corporation, Pflugerville, TX

D3239 Assessment of phenotypic insecticide resistance on the vector competence of an *Aedes aegypti* mosquito population from Key West, Florida. **Dongyoung Shin** (dshin@ufl.edu), Chelsea T. Smartt and Barry W. Alto, Univ. of Florida, Vero Beach, FL

D3240 Control of *Culex pipiens* (Diptera: Culicidae) by injection of Natular™ 2EC (spinosad) in a sawmill irrigation system. **Mary A. Sorensen** (marys@placermosquito.org)[1], Jake Hartle[1] and Derek Drews[2], [1]Placer Mosquito and Vector Control District, Roseville, CA, [2]Clarke, St. Charles, IL

D3241 The importance of Bihari ecology: Implications of human and vector-based field studies and quantitative analysis of vector control programs. **David Poche** (davidp@genesislabs.com)[1], Rajesh Garlapati[1], Zaria Torres-Poche[1], William Grant[2], Hsiao-Hsuan Wang[2] and Richard Poche[1], [1]Genesis Laboratories, Inc, Wellington, CO, [2]Texas A&M Univ., College Station, TX

D3242 Efficacy of filter cake and Triplex against *Sitophilus zeamais*. **Tesfaye Tadesse** (tesfayet@ksu.edu) and Bhadriraju Subramanyam, Kansas State Univ., Manhattan, KS

D3243 Fitness impacts of insecticide resistance in the mosquito *Aedes aegypti*. Sidharth Tripathi[1], Sophia Rasmussen[1], Karla Saavedra-Rodriguez[2], William Black[2] and **Emilie Gray** (emilie.gray@coloradocollege.edu)[1], [1]Colorado College, Colorado Springs, CO, [2]Colorado State Univ., Fort Collins, CO

D3244 Efficacy of some wearable devices compared with spray-on insect repellents for the yellow fever mosquito, *Aedes aegypti* (L.) (Diptera: Culicidae). **Immo Hansen** (immoh@nmsu.edu) and Stacy D. Rodriguez, New Mexico State Univ., Las Cruces, NM

D3245 Do bed bugs avoid insecticide dust deposits? **Alvaro Romero** (aromero2@nmsu.edu) and John Agnew, New Mexico State Univ., Las Cruces, NM

D3246 Malaria vectors: On the impact of indoor residual spraying in Lake Victoria regions, Tanzania. **Charles Kakilla** (kakillacharles@gmail.com)[1], Alpharxad Manjurano[1], Fabian Mashauri[2], Safari Kinunghi[1], Eric Lyimo[1], Doris Mangalu[1], Coleman Kishamawe[3], John Changalucha[1], Dismas Mwalimu[4], Richard Oxborough[5] and Stephen Magesa[3], [1]National Institute for Medical Research, Mwanza, Tanzania, [2]National Institute of Medical Research, Mwanza, Tanzania, [3]Abt Associates, Mwanza, Tanzania, [4]National Malaria Control Programme, Dar es Salaam, Tanzania, [5]Abt Associates, Cambridge, MA

D3247 Effect of wildlife-targeted tick control products on white-footed mice and white-tailed deer. **Erika Machtinger** (etm10@psu.edu)[1] and Andrew Li[2], [1]Pennsylvania State Univ., University Park, PA, [2]USDA - ARS, Beltsville, MD

D3248 Characterizing mechanisms of an essential oil-based biopesticide for bed bug control. **Fang (Rose) Zhu** (fang.zhu@wsu.edu)[1], Meixiang Wu[1], Adekunle Adesanya[1], Laura Lavine[1] and Doug Walsh[2], [1]Washington State Univ., Pullman, WA, [2]Washington State Univ., Prosser, WA

D3249 Botanical compound *p*-anisaldehyde deters larval lone star tick, *Amblyomma americanum* (L.) (Acari: Ixodidae), and halts reproduction by gravid adults. **Allan Showler** (allan.showler@ars.usda.gov), USDA - ARS, Kerrville, TX

D3250 Engaging school nurses to promote integrated pest management of public health pests. **Kathy Murray** (kathy.murray@maine.gov), Maine Dept. of Agriculture, Conservation and Forestry, Augusta, ME

D3251 Measuring IPM in schools using a specialized survey versus IPM Star Audits – What did we learn? **Janet Hurley** (ja-hurley@tamu.edu)[1], Blake Bennett[1], Michael Merchant[1], Thomas Green[2], Kathy Murray[3], Shaku Nair[4], Dawn Gouge[4], Belinda Messenger[5] and Ashley Freeman[5], [1]Texas A&M Univ., Dallas, TX, [2]IPM Institute of North America, Madison, WI, [3]Maine Dept. of Agriculture, Conservation and Forestry, Augusta, ME, [4]Univ. of Arizona, Maricopa, AZ, [5]California Dept. of Pesticide Regulation, Sacramento, CA

D3252 FANA: Next generation RNA silencing technology to target pathogens in blood and ectoparasite blood-feeders. **Wayne Hunter** (wayne.hunter@ars.usda.gov)[1], Jackie Metz[1], Kevin B. Temeyer[2], Adalberto A. Pérez de León[2], John Tomich[3] and Veenu Aishwarya[4], [1]USDA - ARS, Fort Pierce, FL, [2]USDA - ARS, Kerrville, TX, [3]Kansas State Univ., Manhattan, KS, [4]AUM LifeTech, Philadelphia, PA

D3618 Monitoring for resistance to insecticides in Culex nigripalpus (Theobald) using a glass vial technique and mechanisms of resistance. Lambert Kanga (lambert.kanga@famu.edu), Florida A&M Univ., Tallahassee, FL

Poster: PBT, Feeding and Energy Metabolism

Mile High Ballroom (Convention Center)

D3253 Effects of overwintering location on larval emerald ash borer (Coleoptera: Buprestidae) energy reserves. **Dylan Tussey** (tusse001@umn.edu)[1], Brian Aukema[1], Charles Flower[2], Kathleen S. Knight[2] and Robert Venette[3], [1]Univ. of Minnesota, St. Paul, MN, [2]USDA - Forest Service, Delaware, OH, [3]USDA - Forest Service, St. Paul, MN

D3254 Genetic adaptations in energy metabolism and gene family expansions revealed by comparative transcriptomics of three Chagas disease triatomine vectors. **Rolando Rivera-Pomar** (rrivera@unnoba.edu.ar)[1], Jesús Martinez-Barnetche[2], Andrés Lavore[1] and Mario Rodriguez-López[2], [1]Univ. Nacional del Noroeste de Buenos Aires, Pergamino, Argentina, [2]Instituto Nacional de Salud Pública, Cuernavaca, Mexico

D3255 Survival and feeding rates of four aphid species on various sucrose concentrations in diets. **Gary Puterka** (gary.puterka@ars.usda.gov)[1], Scott Nicholson[1] and William Rodney Cooper[2], [1]USDA - ARS, Stillwater, OK, [2]USDA - ARS, Wapato, WA

D3256 Silencing and functional characterization of tergal gland-associated alpha amylase in the German cockroach (*Blattella germanica* L.). Aaron Myers, **Ameya Gondhalekar** (ameyag@purdue.edu), Kyle Pluchar, Kurt Saltzmann, Mahsa Fardisi, Gary Bennett and Michael Scharf, Purdue Univ., West Lafayette, IN

D3257 Stable isotope studies on nitrogen resource management in American cockroaches using ^{15}N-enriched NH_4Cl. **Donald E. Mullins** (mullinsd@vt.edu), Benjamin Gill, Mark Hanigan, Brian Strahm and Sandra E. Gabbert, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

D3258 Mating status and human blood meal size in the arbovirus vector *Aedes aegypti*. **Yassi Hafezi** (yhafezi@gmail.com), Erica Tennant, Mariana Wolfner and Laura Harrington, Cornell Univ., Ithaca, NY

D3259 Intraspecific competition affects larval foraging and pupation behavior, survival, development, and sex ratio of spotted wing drosophila (*Drosophila suzukii*). **Cherre Bezerra Da Silva** (entomologista@gmail.com), Kyoo Park and Vaughn Walton, Oregon State Univ., Corvallis, OR

D3260 Insect powders as ingredients for artificial diets for *Coleomegilla maculata* (Coleoptera: Coccinellidae). **M. Guadalupe Rojas** (guadalupe.rojas@ars.usda.gov) and Juan Morales-Ramos, USDA - ARS, Stoneville, MS

D3261 Interactive effects of dietary phytochemicals and an insecticide-fungicide combination on honey bee survival. **Ling-Hsiu Liao** (liao19@illinois.edu) and May Berenbaum, Univ. of Illinois, Champaign, IL

D3262 Effect of moisture on migration and mortality of black soldier fly, *Hermetia illucens* (Diptera: Stratiomyidae), larvae. **Joshua Villazana** (joshua.villazana@maine.edu), Dylan Cunningham and Andrei Alyokhin, Univ. of Maine, Orono, ME

D3263 Resorption function of salivary glands of blacklegged tick, *Ixodes scapularis*. **Donghun Kim** (kp5091@ksu.edu) and Yoonseong Park, Kansas State Univ., Manhattan, KS

D3264 Friends with benefits: Can UV enhance *Drosophila melanogaster* performance? **Raymond Berry** (rxb012@shsu.edu), New Mexico State Univ., Las Cruces, NM

Poster: PBT, Physiology and Morphology

Mile High Ballroom (Convention Center)

D3265 *Elenchus koebelei* (Strepstiptera: Elenchidae) optics - That's not the way I see it. **Marisano James** (mjajames@ucdavis.edu), Univ. of California, Davis, CA

D3266 Waveform morphology of auditory evoked brain potentials and audibility in *Acheta domesticus*. **Al Yonovitz** (al.yonovitz@umontana.edu), Silas Smith and Harley Kincheloe, Univ. of Montana, Missoula, MT

D3267 Overview of the ligand binding profiles of chemosensory proteins from the red imported fire ant, *Solenopsis invicta*. **John Boswell** (jboswell@ufl.edu), Arun Wanchoo and Nemat Keyhani, Univ. of Florida, Gainesville, FL

D3268 Functional characterization of outer membrane vesicles (OMVs) in *Xenorhabdus nematophila* and *Photorhabdus luminescens* through immune defense reactions of the insects. **Reyhaneh Darsouei** (r.darsouei@gmail.com) and Javad Karimi, Ferdowsi Univ., Mashhad, Iran

D3269 Evaluation of antisera for an enzyme immunoassay and extraction procedures for the measurement of insect ecdysteroids. David A. McKinney, Michael Strand and **Mark Brown** (mrbrown@uga.edu), Univ. of Georgia, Athens, GA

D3270 Characterization of four mitochondrial cytochrome P450 genes in *Tribolium castaneum*. Jing Chang[1], Hua Wu[1], **Jianxiu Yao** (jianxiuy@ksu.edu)[1], James Campbell[2], Frank Arthur[2] and Kun Yan Zhu[1], [1]Kansas State Univ., Manhattan, KS, [2]USDA - ARS, Manhattan, KS

D3271 Transcriptomic responses to host plant in the sugarcane aphid, *Melanaphis sacchari*. Travis van Warmerdam[1], Austin Drury[1], Eleanor Moen[1], David C. Rinker[2] and **Jonas G. King** (jonas.king@msstate.edu)[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Vanderbilt Univ., Nashville, TN

D3272 Impacts of altered social behaviors and associated changes in gene expression on limiting disease transmission in fire ants (*Solenopsis invicta*). **Heather Axen** (heather.axen@salve.edu) and Lauren Plant, Salve Regina Univ., Newport, RI

D3273 Plasticity of *Diadegma fenestrale Ichnovirus* (DfIV) genes in hymenopteran host, *D. fenestrale,* and lepidopteran host, *Plutella xylostella*. **Juil Kim** (forweek@korea.kr) and Min Kwon, National Institute of Crop Science, Pyeongchang, South Korea

D3274 Generalist assassin bug *Platymeris biguttatus* (Reduviidae) targets nervous system escape circuitry of its cockroach prey and supports the "locomotor ganglia hypothesis" developed for specialist wasp predators. **Cole Gilbert** (cg23@cornell.edu), Kristianna Lea, Ann Dunn and Linda Rayor, Cornell Univ., Ithaca, NY

D3275 Quantitative characterization of pederin in the rove beetle (Staphilinidae: *Paederus*) in Mazandaran and Fars Provinces, Iran. **Sahar Bazrafkan** (bazrafcan@yahoo.com), Tehran Univ. of Medical Sciences, Tehran, Iran

D3276 Morphological study of *Cerambyx* spp. eggs using the scanning electron microscope. **Ehab Zgheb** (szgheb@yahoo.com), Damascus Univ., Damascus, Syria

D3277 Size variation and expression pattern of *Drosophila*-type AChE gene (*ace2*) in the small brown planthopper, *Laodelphax striatellus* Fallén (Hemiptera: Delphacidae). **Bo Yoon Seo** (seoby@korea.kr)[1], Chan-yeong Kang[1], Sang Min Kim[2], Chang-Gyu Park[1], Jin Kyo Jung[3] and Young-Ho Ko[4], [1]National Institute of Agricultural Sciences, Wanju-Gun, South Korea, [2]National Institute of Crop Science, Wanju-Gun, South Korea, [3]National Institute of Crop Science, Suwon, South Korea, [4]Hallym Univ., Anyang, South Korea

D3278 Comparative analysis of sex-determining gene, *transformer*, between *Bactrocera scutellata* and *B. depressa*. **Gimyeon Kwon** (scalekgm@hanmail.net) and Yonggyun Kim, Andong National Univ., Andong, South Korea

D3279 The midgut microbiota plays an essential role in *Phlebotomus duboscqi* sand fly vector competence for *Leishmania major*. **Isabelle Louradour** (isabelle.louradour@nih.gov)[1], Carolina Cunha Monteiro[2], Ehud Inbar[1], Kashinath Ghosh[1], Phillip Lawyer[1], Andrea Paun[1], Margery Smelkinson[1], Nagila Secundino[2], Michael Lewis[3], Dinesh Erram[4], Ludek Zurek[4] and David Sacks[1], [1]National Institutes of Health, Bethesda, MD, [2]Centro de Pesquisas René Rachou, Belo Horizonte, Brazil, [3]London School of Hygiene and Tropical Medicine, London, United Kingdom, [4]Kansas State Univ., Manhattan, KS

D3280 Selective serotonin reuptake inhibitors, neurobiology, and behavior of *Teleopsis dalmanni*. **Harper Jocque** (harper.jocque@ucdenver.edu) and John Swallow, Univ. of Colorado, Denver, CO

D3281 Does rearing environment affect worker honey bee, *Apis mellifera* L., morphology? **Ashley Mortensen** (mortensena@ufl.edu) and James Ellis, Univ. of Florida, Gainesville, FL

D3282 Evaluation of *Nosema* spore infectivity in honey bees, *Apis mellifera*. **Thomas C. Webster** (thomas.webster@kysu.edu), Katherine Kamminga and Martin Matisoff, Kentucky State Univ., Frankfort, KY

D3283 Mechanisms of increased lifespan in hypoxia in the alfalfa leafcutting bee, *Megachile rotundata*. **Kendra Greenlee** (kendra.greenlee@ndsu.edu)[1], Julia Bowsher[1], Britt Heidinger[1], Joseph P. Rinehart[2] and George Yocum[2], [1]North Dakota State Univ., Fargo, ND, [2]USDA - ARS, Fargo, ND

D3284 The influence of pile length and body size on rates of heat loss in the bumble bee, *Bombus vosnesenskii*. **Zachary Parsons** (zparsons@uwyo.edu)[1], Kennan Oyen[1], James P. Strange[2], Jeffrey Lozier[3] and Michael E. Dillon[1], [1]Univ. of Wyoming, Laramie, WY, [2]USDA - ARS, Logan, UT, [3]Univ. of Alabama, Tuscaloosa, AL

D3285 Critical thermal limits of the heterothermic bumble bee, *Bombus impatiens* (Hymenoptera: Apidae). **Kennan Oyen** (koyen@uwyo.edu) and Michael E. Dillon, Univ. of Wyoming, Laramie, WY

D3286 Predation of rove beetle, *Dalotia coriaria* adult on western flower thrips, *Frankliniella occidentalis* pupal stage. **Yinping Li** (yinpingli@ksu.edu) and Raymond Cloyd, Kansas State Univ., Manhattan, KS

D3287 Microbes serve as food for the development of *Drosophila suzukii* on fruits. **Xiaoli Bing** (xb48@cornell.edu)[1], Joseph Gerlach[1], Gregory Loeb[2] and Nicolas Buchon[1], [1]Cornell Univ., Ithaca, NY, [2]Cornell Univ., Geneva, NY

D3288 Response of *Cimex lectularius* to simulated traumatic insemination. **Lily Brooks** (lmb622@msstate.edu) and Jonas G. King, Mississippi State Univ., Mississippi State, MS

D3289 Characterization of Nrf2 pathway activity following the Asian malaria mosquito, *Anopheles stephensi*. AEM Rubayet Elahi[1], James C. Douglas[2], Rebekah Ward[2], Hayden H. Roys[2], Sinthia J. Alam[2] and **Helen Beneš** (beneshelen@uams.edu)[2], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Univ. of Arkansas for Medical Sciences, Little Rock, AR

D3290 Ventilation related motor patterns of locust's discontinuous gas exchange. **Stav Talal** (stav.talal@gmail.com)[1], Eran Gefen[2] and Amir Ayali[1], [1]Tel-Aviv Univ., Tel-Aviv, Israel, [2]Univ. of Haifa-Oranim, Kiryat Tivon, Israel

D3291 X-ray radiation a possible hero for Parkinson's disease symptoms in *Drosophila melanogaster*. **Nubia Rivas** (nrivas05@nmsu.edu) and Giancarlo Lopez-Martinez, New Mexico State Univ., Las Cruces, NM

D3292 Side effects of breathing include faster aging in *Tenebrio molitor*. **Alyssa De La Torre** (alyssa_m@nmsu.edu) and Giancarlo Lopez-Martinez, New Mexico State Univ., Las Cruces, NM

D3293 Flying high and living longer: The design and modification of assays used to measure healthspan in *Drosophila melanogaster*. **Michael Balogh** (baloghm5@nmsu.edu), Nubia Rivas and Giancarlo Lopez-Martinez, New Mexico State Univ., Las Cruces, NM

D3612 Effect of vaccination on the production of semiochemicals in the honeybee queen. **Margarita Orlova** (margaritaor@gmail.com)[1], Gyan Harwood[1], Dalial Freitak[2] and Gro Amdam[1], [1]Arizona State Univ., Tempe, AZ, [2]Univ. of Helsinki, Helsinki, Finland

Poster: P-IE, Behavior and Ecology 1

Mile High Ballroom (Convention Center)

D3294 Fire ant (*Solenopsis invicta*) interactions with spider milkweed (*Asclepias viridis*) communities in north Texas. **Loriann Garcia** (lgarcia@austincollege.edu), Payal Patel, Sydney Jackson, Shamika Ninan, Emma Grundy and Monica Martinez, Austin College, Sherman, TX

D3295 Biology of the papaya mealybug, *Paracoccus marginatus,* on cassava. Thien An Dang[1], Khac Hoang Le[1] and **Keiji Takasu** (takasu@brs.kyushu-u.ac.jp)[2], [1]Nong Lam Univ., Hochiminh, Viet Nam, [2]Kyushu Univ., Fukuoka, Japan

D3296 Grasshoppers of western South Dakota: A species diversity survey. **Patrick Wagner** (patrick.wagner@sdstate.edu)[1], Erica Anderson[2], Amanda Bachmann[3] and Adam Varenhorst[2], [1]South Dakota State Univ., Rapid City, SD, [2]South Dakota State Univ., Brookings, SD, [3]South Dakota State Univ., Pierre, SD

D3297 Distribution and abundance of fireflies (Lampyridae) in agricultural landscapes. **Andrew Aschwanden** (aca12@psu.edu) and John Tooker, Pennsylvania State Univ., University Park, PA

D3298 Characterization of larval movement of *Spodoptera eridania* (Lepidoptera: Noctuidae) in non-Bt soybean. **Thiago Luis Martins Fanela** (tfanela@yahoo.com.br)[1], Edson Luiz Lopes Baldin[1], Nicole Luhr[2] and Thomas Hunt[2], [1]Univ. Estadual Paulista, Botucatu, Brazil, [2]Univ. of Nebraska, Concord, NE

D3299 Population structure, gene flow, and movement of navel orangeworm (*Amyelois transitella*) in California. **Jacob Wenger** (jawenger@csufresno.edu), California State Univ., Fresno, CA

D3300 Diversity and relative abundance of arthropods in Oklahoma winter canola agrolandscapes. **Casi Jessie** (casi.jessie@gmail.com)[1], Kris Giles[1], Brian McCornack[2], William Jessie[1], James Hagler[3] and Tim Kring[4], [1]Oklahoma State Univ., Stillwater, OK, [2]Kansas State Univ., Manhattan, KS, [3]USDA - ARS, Maricopa, AZ, [4]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

D3301 Managing pests of urban farms. **James Jasinski** (jasinski.4@osu.edu)[1] and Jacqueline Kowalski[2], [1]The Ohio State Univ., Urbana, OH, [2]The Ohio State Univ., Stow, OH

D3302 Are northern Great Plains grasslands resilient to sustained high levels of grasshopper herbivory? **David Branson** (dave.branson@ars.usda.gov), USDA - ARS, Sidney, MT

D3303 Electrophysiological and behavioral response of *Chrysoperla rufilabris* (Neuroptera: Chrysopidae) to methyl salicylate. **Jordano Salamanca** (jordanosalamanca@gmail.com)[1], Brígida Souza[2], Jonathan Lundgren[3] and Cesar Rodriguez-Saona[4], [1]Univ. Nacional Abierta y a Distancia, Bogotá, Colombia, [2]Univ. Federal de Lavras, Lavras, Brazil, [3]Ecdysis Foundation, Estelline, SD, [4]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

D3304 Challenges, goals, and accomplishments in pear psylla, *Cacopsylla pyricola* (Förster), management research in the Wenatchee Valley of Washington. **Louis Nottingham** (louis.nottingham@wsu.edu) and Elizabeth H. Beers, Washington State Univ., Wenatchee, WA

D3305 Habitat diversification with cover crop residues affect beetle pest populations in vegetable fields. **Peter Coffey** (peterlcoffey@gmail.com), Univ. of Maryland, College Park, MD

D3306 The resurgence of the South American locust (*Schistocerca cancellata*): Understanding the nutritional ecology of marching locust nymphs. Arianne Cease[1], **Rick Overson** (rickoverson@gmail.com)[1], Ruth Farington[1], Geordana Cespedes[2], Jorge Frana[3], Alberto Gutierrez[4], Nelson Joaquin[5], Marion Le Gall[1], Jenni Learned[1], Carlos Maldonado[6], Hector Medina[6], Wilda Ramirez[6], Marcelino Rendon[6], Monica Roca[6], Luis Shimura[2] and Eduardo Trumper[3], [1]Arizona State Univ., Tempe, AZ, [2]SENASAG, Beni, Bolivia, [3]INTA - CONICET, Buenos Aires, Argentina, [4]Instituto Nacional de Innovación Agropecuaria y Forestal, La Paz, Bolivia, [5]Centro de Investigación Agrícola Tropical, Santa Cruz, Bolivia, [6]Servicio Nacional de Sanidad y Calidad Agroalimentaria, Buenos Aires, Argentina

D3307 Flight activity of *Cotesia flavipes* and temperature influence in populations from Brazil. Thamiris Sipriano-Nascimento[1], Amanda Lemes[1], Natalia Vieira[1], Alessandra Marieli Vacari[2] and **Sergio De Bortoli** (bortoli@fcav.unesp.br)[1], [1]Univ. Estadual Paulista, Jaboticabal, Brazil, [2]Univ. de Franca, Franca, Brazil

D3308 Legacy effects of preceding cover crop species on mycorrhizae, nutrients, and plant-insect interactions in a cash crop. **Ebony Murrell** (egmurrell@gmail.com), Swayamjit Ray, Mary Lemmon and Jason Kaye, Pennsylvania State Univ., University Park, PA

D3309 Presentation withdrawn

D3310 Within season changes in genetic variation of *Tetranychus urticae* in tomato fields. **Alejandro Alaniz** (aalaniz@ncsu.edu)[1], James F. Walgenbach[2] and George G. Kennedy[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Mills River, NC

D3311 Longhorned beetle (Coleoptera: Cerambycidae) species diversity and community structure in temperate forests differing in size. **Daniel Pavuk** (dmpavuk@bgsu.edu), Bowling Green State Univ., Bowling Green, OH

D3312 Identifying rose cultivars for the post-Japanese beetle landscape. **Melissa Schreiner** (schreinm@rams.colostate.edu), Wendiln Burns, Erika Peirce and Whitney Cranshaw, Colorado State Univ., Fort Collins, CO

D3313 Seasonal abundance of the tarnished plant bug (*Lygus lineolaris* (Palisot de Beauvois)) on wild host plants in the Midsouth. **Katherine Parys** (katherine.parys@ars.usda.gov), Bryce Blackman, Maribel Portilla and Randall Luttrell, USDA - ARS, Stoneville, MS

D3314 Importance of non-native winter annual mustards as bridge species for insects associated with brassica crops. **Zachary Longtine** (zlongtin@colostate.edu), Colorado State Univ., Fort Collins, CO

D3315 Difference of insect pest occurrence patterns between in smart farming and conventional type of greenhouse for tomato. **Heon Yoon** (sect-@hanmail.net), Hye-Ri Kwon, Yong-Man Yu and Young Nam Youn, Chungnam National Univ., Daejeon, South Korea

D3316 Offspring survivorship of diapausing and non-diapausing western corn rootworm under field and laboratory conditions. **Bryan French** (wade.french@ars.usda.gov)[1], Aaron J. Gassmann[2] and Bruce Hibbard[3], [1]USDA - ARS, Brookings, SD, [2]Iowa State Univ., Ames, IA, [3]USDA - ARS, Columbia, MO

D3613 Arabidopsis-cabbage aphid interaction: Role of Myzus Persicae-Induced Lipase1 (MPL1) gene. **Ellis Johnson** (ellisjamesj@gmail.com), Suresh Varsani, Kaitlin Chapman, and Joe Louis, Univ. of Nebraska, Lincoln, NE

Poster: P-IE, Biological Control

Mile High Ballroom (Convention Center)

D3317 The Dundee Biological Control Laboratory: Mass rearing the parasitoid *Tamarixia radiata* for control of the Asian citrus psyllid, *Diaphorina citri*, in Florida. **Robin Stuart** (robin.stuart@freshfromflorida.com), Florida Dept. of Agriculture and Consumer Services, Dundee, FL

D3318 Biological control of the Asian ctirus psyllid in the Lower Rio Grande Valley, TX, 2017. Daniel Flores[1], Mayra Rangel[1], Rupert Santos[1], Jason Whited[2], Gilberto Salazar[2], Christopher Dungan[2], Dulce Hernandez[2], Mayra Monsivais[2], **Christopher Vitek** (christopher.vitek@utrgv.edu)[2] and Matt A. Ciomperlik[1], [1]USDA - APHIS, Edinburg, TX, [2]Univ. of Texas, Edinburg, TX

D3319 Mass rearing and genetic diversity of *Cotesia flavipes* (Cameron) in Brazil. **Andrea Joyce** (ajoyce2@ucmerced.edu)[1], Alessandra Marieli Vacari[2] and Sergio De Bortoli[3], [1]Univ. of California, Merced, CA, [2]Univ. de Franca, Franca, Brazil, [3]Univ. Estadual Paulista, Jaboticabal, Brazil

D3320 Feeding preferences of natural enemies to the sugarcane aphid, *Melanaphis sacchari* (Hemiptera: Aphididae). **Laura Weiser Erlandson** (laura.erlandson@tamuct.edu), Texas A&M Univ., Killeen, TX

D3321 Prey stage preference and functional response of *Delphastus catalinae* and *D. pallidus* (Coleoptera: Coccinellidae) on *Bemisia tabaci* (Hemiptera: Aleyrodidae). **Vivek Kumar** (vivekiari@ufl.edu)[1], Cindy McKenzie[2] and Lance Osborne[1], [1]Univ. of Florida, Apopka, FL, [2]USDA - ARS, Fort Pierce, FL

D3322 Evaluation of *Nephus* sp. augmentative releases to control mealybug on citrus in South Africa. **Stephan Honiball** (info@vitalbugs.co.za)[1], Marike Ferreira[1] and Elsje Kleynhans[2], [1]Vital Bugs, Tzaneen, South Africa, [2]South African Subtropical Growers Organization, Tzaneen, South Africa

D3323 Retreat availability influences the social dynamics of the prolonged subsocial huntsman spiders. **Linda Rayor** (lsr1@cornell.edu), Cornell Univ., Ithaca, NY

D3324 The natural enemy complex associated with European elm scale in Colorado, with emphasis on associated parasitoids. **Erika Peirce** (erika.peirce@gmail.com), Rachael Sitz, Whitney Cranshaw, Melissa Schreiner and Wendiln Burns, Colorado State Univ., Fort Collins, CO

D3325 Micro-encapsulation of *Bacillus thuringiensis* to manage lepidopteran pests of Cruciferae. Oumar Bashir[1], Jerome Claverie[1], Pierre Lemoyne[2] and **Charles Vincent** (charles.vincent@agr.gc.ca)[2], [1]Univ. de Sherbrooke, Sherbrooke, QC, Canada, [2]Agriculture and Agri-Food Canada, Saint-Jean-sur-Richelieu, QC, Canada

D3326 Natural control of Pentatomidae (Heteroptera) eggs in rice crop in Panama. **Bruno Zachrisson** (bazsalam@gmail.com)[1], Pamela Polanco[2], Pedro Osorio[1] and Ismael Camargo[1], [1]Instituto de Investigación Agropecuária de Panamá, Panama, Panama, [2]Univ. of Panama, Panama, Panama

D3327 Floral habitat effects on parasitoid diversity and community composition adjacent to alfalfa. **Makenzie Pellissier** (mbenande@uwyo.edu) and Randa Jabbour, Univ. of Wyoming, Laramie, WY

D3328 Efficacy of predatory mites *Amblyseius andersoni, Neoseiulus californicus, N. cucumeris,* and *N. swirskii* against *Polyphagotarsonemus latus* in Arkansas-grown primocane blackberries. **Jessica LeFors** (lefors@uark.edu) and Donn Johnson, Univ. of Arkansas, Fayetteville, AR

D3329 Mild 2016-17 season deemed suitable for entomopathogenic fungus and parasitoid activity on aphid populations in barley. **Yaziri Gonzalez** (yazgonzalez17@uky.edu) and Raul T. Villanueva, Univ. of Kentucky, Princeton, KY

D3330 Predation of sentinel eggs in cotton and sorghum in New Mexico. **Jane Breen Pierce** (japierce@nmsu.edu), Patricia E. Monk and John Idowu, New Mexico State Univ., Las Cruces, NM

D3331 Do community gardens increase the abundance and richness of beneficial insects in surrounding green spaces? **Ashley Bennett** (abb@nmsu.edu), Araceli Lopez-Binder and Wesley Noe, New Mexico State Univ., Los Lunas, NM

D3332 Effects of growing medium type and moisture level on predation by adult rove beetle, *Dalotia coriaria* (Coleoptera: Staphylinidae), on fungus gnat, *Bradysia* sp. nr. *coprophila* (Diptera: Sciaridae), larvae under laboratory and greenhouse conditions. Raymond Cloyd and **Nathan Herrick** (nherrick@ksu.edu), Kansas State Univ., Manhattan, KS

D3333 Exploring the relationship between *Trissolcus japonicus* and flowers. **Victoria Skillman** (skillmav@onid.orst.edu)[1], Hanna McIntosh[2] and Jana Lee[2], [1]Oregon State Univ., Corvallis, OR, [2]USDA - ARS, Corvallis, OR

D3334 Management of twospotted spider mite with *Phytoseiulus persimilis* in tomatoes. **David Owens** (owensd119@ufl.edu), James F. Walgenbach, Thomas Ohmen and Daniel Olvera, North Carolina State Univ., Mills River, NC

D3335 FANA Technology - New RNA silencing approach for targeting bacteria in citrus trees and insect pests (Coleoptera, Hemiptera). **Jackie Metz** (jackiemetz@bellsouth.net)[1,2], Wayne Hunter[1], Andres Sandoval-Mojica[2], Sidney Altman[3], Michael Boyle[4], Veenu Aishwarya[5], Greg McCollum[1] and Kirsten Pelz-Stelinski[2], [1]USDA - ARS, Fort Pierce, FL, [2]Univ. of Florida, Lake Alfred, FL, [3]Yale Univ., New Haven, CT, [4]Smithsonian Marine Station, Fort Pierce, FL, [5]AUM LifeTech, Philadelphia, PA

Poster: P-IE, Insecticides and Other Control 1

Mile High Ballroom (Convention Center)

D3336 Using surfactants and insecticides to manage thrips and thrips transmitted tospoviruses. **Rafia Khan** (rkhan@ufl.edu)[1], Dakshina Seal[1], Shouan Zhang[1], Edward Evans[1], Oscar Liburd[2] and Rajagopalbabu Srinivasan[3], [1]Univ. of Florida, Homestead, FL, [2]Univ. of Florida, Gainesville, FL, [3]Univ. of Georgia, Tifton, GA

D3337 Control of thrips with selected insecticidal treatments in Texas cotton. **Suhas Vyavhare** (suhas.vyavhare@ag.tamu.edu)[1], Blayne Reed[2], Adam Kesheimer[1], Megha Parajulee[1], Robert Bowling[3] and Abdul Hakeem[1], [1]Texas A&M Univ., Lubbock, TX, [2]Texas A&M Univ., Plainview, TX, [3]Texas A&M Univ., Corpus Christi, TX

D3338 Inscalis™ insecticide: A novel insecticide for management of piercing-sucking pests. **Joe Stout** (joseph.stout@basf.com), Teresia Nyoike and Vincent Salgado, BASF Corporation, Research Triangle Park, NC

D3339 *In vitro* bioassay development targeting *Aphis glycines* and *Nezara viridula* for the discovery of novel insecticidal genes. **Amber McGuire** (amcguire@agbiome.com), Hai Tran, Dylan Kraus and Mary Kroner, AgBiome, Inc, Research Triangle Park, NC

D3340 Effects of paclobutrazol on systemic neonicotinoid insecticides applied to four *Fraxinus* species over three years. **Andrew Tluczek** (tluczek@msu.edu)[1], Deborah McCullough[1], Sara Tanis[1], James Wieferich[1] and Phillip A. Lewis[2], [1]Michigan State Univ., East Lansing, MI, [2]USDA - APHIS, Buzzards Bay, MA

D3341 Variability in response of corn earworm to insecticides on sweet corn over nine years in Ohio. **Celeste Welty** (welty.1@osu.edu)[1] and James Jasinski[2], [1]The Ohio State Univ., Columbus, OH, [2]The Ohio State Univ., Urbana, OH

D3342 Developing soybean seed treatment recommendations in South Dakota. **Brady Hauswedell** (brady.hauswedell@sdstate.edu), Philip Rozeboom, Febina Mathew, Jonathan Kleinjan and Adam Varenhorst, South Dakota State Univ., Brookings, SD

D3343 From gene to landscape level: A 6-year project on control of *Ips typographus* under climatic change. **Fredrik Schlyter** (fredrik.schlyter@slu.se)[1,2] and Marek Turcani[1], [1]Czech Univ. of Life Sciences, Prague, Czech Republic, [2]Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

D3344 Performance of fall armyworm possessing Cry1A.105 and Cry2Ab2 resistance alleles on non-Bt and pyramided Bt corn traits. **Chengqi Zhu** (changeness@icloud.com)[1,2], Ying Niu[1], Yiwan Zhou[1], Graham P. Head[3], Paula A. Price[3], Xiujun Wen[2] and Fangneng Huang[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]South China Agricultural Univ., Guangzhou, China, [3]Monsanto Company, St. Louis, MO

D3345 Biotoxic effect of *Entada gigas* oil extract and its pulled fractions on army ants, *Eciton burchellii*. **Adenike Adeyemo** (acadeyemo@futa.edu.ng)[1], Adedayo Adeniyi[2] and Nelson Eyinla[3], [1]Federal Univ. of Technology, Akure, Nigeria, [2]Federal College of Agriculture, Akure, Nigeria, [3]IFAD/Community-Based Natural Resource Management-Niger Delta, Akure, Nigeria

D3346 Investigation on the environmental fate of emerald ash borer pesticides toward non-target insects. **Rasha Alakeel** (rkma@rams.colostate.edu), Colorado State Univ., Fort Collins, CO

D3347 Evaluating the efficacy of seed treatments in South Dakota winter wheat. **Philip Rozeboom** (philip.rozeboom@sdstate.edu) and Adam Varenhorst, South Dakota State Univ., Brookings, SD

D3348 Insecticide resistance in the glassy-winged sharpshooter, a vector of *Xylella fastidiosa*. **Thomas M. Perring** (thomas.perring@ucr.edu)[1], Nilima Prabhaker[1], Steven J. Castle[2], Sharon Andreason[1], David R. Haviland[3] and Beth Stone-Smith[4], [1]Univ. of California, Riverside, CA, [2]USDA - ARS, Maricopa, AZ, [3]Univ. of California Cooperative Extension, Bakersfield, CA, [4]USDA - APHIS, Sacramento, CA

D3349 Managing ficus whitefly, *Singhiella simplex*, without insecticides. **Catharine Mannion** (cmannion@ufl.edu), Univ. of Florida, Homestead, FL

D3350 Miticides used to control twospotted spider mite (*Tetranychus urticae*) in strawberry nurseries may affect populations in Florida production fields. **Justin Renkema** (justin.renkema@ufl.edu)[1], Braden Evans[1] and James F. Walgenbach[2], [1]Univ. of Florida, Wimauma, FL, [2]North Carolina State Univ., Mills River, NC

D3351 Companion planting and reduced-risk insecticides for managing diamondback moth, *Plutella xylostella*, in field grown cabbage. **Oscar Liburd** (oeliburd@ufl.edu) and Zulaikha Mazlan, Univ. of Florida, Gainesville, FL

D3352 Fungal endophyte compatibility with imidacloprid seed treatment and their combined effect on *Aphis gossypii* probing response. **Polly Harding** (pollyharding@tamu.edu) and Gregory Sword, Texas A&M Univ., College Station, TX

D3353 Pesticide-mediated disruption of communication between raspberries and the spotted wing drosophila. **Raul Narciso Guedes** (guedes@ufv.br)[1], Stephen Corbett[2], Matthew Rodriguez[3], Joy Goto[2] and Spencer Walse[4], [1]Univ. Federal de Viçosa, Viçosa, Brazil, [2]California State Univ., Fresno, CA, [3]Univ. of California, Davis, CA, [4]USDA - ARS, Parlier, CA

D3354 Survival of variable bollworm and tobacco budworm larval instars exposed to a commercially-formulated Bt product in diet-incorporated bioassays. **Nathan Little** (nathan.little@ars.usda.gov)[1], M. Ibrahim Ali[2], Randall Luttrell[1] and Michelle Mullen[1], [1]USDA - ARS, Stoneville, MS, [2]U.S. Food and Drug Administration, Jefferson, AR

D3355 Non-target effects of organic insecticides on stink bug egg parasitoids. **Emily Ogburn** (emily_ogburn@ncsu.edu) and James F. Walgenbach, North Carolina State Univ., Mills River, NC

D3356 Evaluating different pesticides for European red mite management and ecotoxicity to mite predators in apple orchard ecosystem. **Neelendra Joshi** (nkjoshi@uark.edu)[1] and David Biddinger[2], [1]Univ. of Arkansas, Fayetteville, AR, [2]Pennsylvania State Univ., Biglerville, PA

D3357 Evaluation of three products to protect American beech tree from beech scale (*Cryptococcus fagisuga* Lind.) and beech bark disease. **James Wieferich** (wiefer10@msu.edu) and Deborah G. McCullough, Michigan State Univ., East Lansing, MI

D3358 Evolution of insect susceptibility to Rynaxypyr®: Stasis and change. **Luis Teixeira** (luis.a.teixeira@dupont.com), John Andaloro and I. Billy Annan, DuPont Crop Protection, Newark, DE

D3359 Scouring multiple environmental sources for new lepidopteran-active traits. **Marie Encarnacion** (mencarnacion@agbiome.com), Ryan Gerber, Mary Kroner, AgBiome, Inc, Research Triangle Park, NC

D3360 Resistance monitoring of *Spodoptera frugiperda* (J.E. Smith) and *Chrysodeixis includens* (Walker) to flubendiamide in Brazil. **Daniela Okuma** (daniela.okuma@bayer.com), Ana Cuenca, Jeruza Vilarinho and Francisco Leonel Junior, Bayer SA, Paulinia, Brazil

Poster: P-IE, Invasive Species

Mile High Ballroom (Convention Center)

D3361 *Drosophila suzukii*, where are you? The case of an invasive pest of cultivated berries in natural Florida habitats. **Lindsy Iglesias** (liglesias@ufl.edu)[1], Ashfaq Sial[2] and Oscar Liburd[1], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Georgia, Athens, GA

D3362 Mortality of overwintering emerald ash borer (Coleoptera: Buprestidae) associated with an extreme cold event in New York state. **Michael I. Jones** (mijone01@syr.edu)[1], Juli Gould[2] and Melissa K. Fierke[1], [1]State Univ. of New York, Syracuse, NY, [2]USDA - APHIS, Buzzards Bay, MA

D3363 Management of the sugarcane aphid on grain sorghum in Georgia. **G. David Buntin** (gbuntin@uga.edu)[1], Phillip Haar[2], Phillip Roberts[3] and Xinzhi Ni[4], [1]Univ. of Georgia, Griffin, GA, [2]Univ. of Georgia, Athens, GA, [3]Univ. of Georgia, Tifton, GA, [4]USDA - ARS, Tifton, GA

D3364 Initiatives and efforts to manage *Tuta absoluta*, the South American tomato leafminer. **Jaspreet Sidhu** (jsidhu1@vt.edu), Rangaswamy Muniappan and Ahijin Adiga, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

D3365 Developing management practices for the invasive sugarcane aphid (*Melanaphis sacchari*) in grain sorghum in South Carolina. **Francis Reay-Jones** (freayjo@clemson.edu)[1] and Jeremy Greene[2], [1]Clemson Univ., Florence, SC, [2]Clemson Univ., Blackville, SC

D3366 Invasion history of brown marmorated stink bug (*Halyomorpha halys*) in Utah. **Lori R. Spears** (lori.spears@usu.edu), Cody Holthouse, Zachary Schumm and Diane G. Alston, Utah State Univ., Logan, UT

D3367 PestLens: An early-warning system supporting U.S. safeguarding against exotic plant pests. **Douglas McPhie** (drmcphie@ncsu.edu), Sherrie Emerine, Roslyn Noar and Jennifer Fritz, North Carolina State Univ., Raleigh, NC

D3368 Mites associated with egg masses of the viburnum leaf beetle *Pyrrhalta viburni* (Paykull) on *Viburnum tinus* L. **Gaylord Desurmont** (gdesurmont@ars-ebcl.org)[1], Elven Kerdellant[1], Marie-Stéphane Tixier[2], Phillipe Auger[2] and Serge Kreiter[2], [1]USDA - ARS, Montpellier, France, [2]Supagro, Montpellier, France

D3617 Neonicotinoids can affect honey bee food glands. **Selina Bruckner** (szb0130@auburn.edu)[1,2,3], Lars Straub[2,3], Laura Villamar-Bouza[4], Peter Neumann[2,3] and Geoffrey Williams[1,2,3], [1]Auburn Univ., Auburn, AL, [2]Univ. of Bern, Bern, Switzerland, [3]Agroscope, Bern, Switzerland, [4]European Food Safety Authority, Parma, Italy

Poster: P-IE, Population Dynamics

Mile High Ballroom (Convention Center)

D3369 Detection of low-level populations of sweetpotato weevil using multimodal cues. **Livy Williams** (livy.williams@ars.usda.gov)[1], Grant T. McQuate[2], Charmaine Sylva[2], Jennifer Webb[1] and Phillip Wadl[1], [1]USDA - ARS, Charleston, SC, [2]USDA - ARS, Hilo, HI

D3370 Impact of irrigation water level on cotton fleahopper management in the Texas High Plains. **Megha Parajulee** (m-parajulee@tamu.edu), Abdul Hakeem, Wayne Keeling and Stanley C. Carroll, Texas A&M Univ., Lubbock, TX

D3371 Refining the economic threshold for fall armyworm (*Spodoptera frugiperda*) in whorl stage non-Bt field corn. **Glenn Studebaker** (gstudebaker@uaex.edu)[1], Gus Lorenz[2], Nicholas Seiter[3], Courtney Jackson[1] and Nicki Taillon[2], [1]Univ. of Arkansas, Keiser, AR, [2]Univ. of Arkansas, Lonoke, AR, [3]Univ. of Arkansas, Monticello, AR

D3372 Presentation withdrawn

D3373 Corn rootworm species (*Diabrotica* spp.) survey in eastern South Dakota. **Bradley McManus** (bradley.mcmanus@sdstate.edu) and Billy Fuller, South Dakota State Univ., Brookings, SD

D3374 Damage potential and management of *Atherigona reversura* (Diptera: Muscidae) in bermudagrass hay. **William Hudson** (wghudson@uga.edu)[1], William Anderson[2], Dennis Hancock[1] and Zachary Moore[3], [1]Univ. of Georgia, Athens, GA, [2]USDA - ARS, Tifton, GA, [3]Univ. of Georgia, Tifton, GA

D3375 Analysis of thirty years of light trap data for western bean cutworm, *Striacosta albicosta* (Smith) (Lepidoptera: Noctuidae), in Nebraska. Débora Montezano[1], **Priscila Colombo Da Luz** (pricolomboluz@gmail.com)[2], Thomas Hunt[3], Robert Wright[1] and Julie Peterson[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, North Platte, NE, [3]Univ. of Nebraska, Concord, NE

D3376 Impact of plant phenology and spray timing on thresholds for *Helicoverpa zea* (Lepidoptera: Noctuidae) in Bt cotton. **Alejandro Del Pozo** (aidelpoz@ncsu.edu)[1], Dominic Reisig[2], Jeremy Greene[3] and Phillip Roberts[4], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Plymouth, NC, [3]Clemson Univ., Blackville, SC, [4]Univ. of Georgia, Tifton, GA

D3377 Transcriptomic analysis on different developmental stages of *Laodelphax striatellus* (Delphacidae: Hemiptera). Bo Yoon Seo[1], Chang-Gyu Park[1], Jin Kyo Jung[2], Young Ho Koh[3], Jeonghee Lee[4], Junkyoung Choe[4] and **Yong-Lak Park** (yopark@mail.wvu.edu)[5], [1]National Institute of Agricultural Sciences, Wanju-Gun, South Korea, [2]National Institute of Crop Science, Suwon, South Korea, [3]Hallym Univ., Chuncheon, South Korea, [4]SEEDERS Inc, Daejoen, South Korea, [5]West Virginia Univ., Morgantown, WV

D3378 Thrips of Poaceae crops in Biskra region (an arid region of Algeria). **Sabah Razi** (sabah_razi@yahoo.fr)[1], Ernest C. Bernard[2] and Malik Laamari[3], [1]Univ. de Biskra, Biskra, Algeria, [2]Univ. of Tennessee, Knoxville, TN, [3]Univ. de Batna, Batna, Algeria

D3379 The role of variety and fertilization rates on the suceptibility of high tunnel and field grown strawberry to twospotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae). **Jackie Lee** (jalee@uaex.edu) and Michael Brown, Univ. of Arkansas, Little Rock, AR

D3380 Detecting lygus bug-induced stress in greenhouse cut flowers using remote sensing technology. **Elvira de Lange** (esdelange@ucdavis.edu), Keshav Singh, Alison Stewart, Machiko Murdoch, Robert Starnes and Christian Nansen, Univ. of California, Davis, CA

Poster: P-IE, Semiochemicals and Trapping

Mile High Ballroom (Convention Center)

D3381 Trapping the bronze birch borer, *Agrilus anxius*. **Claire E. Rutledge** (claire.rutledge@ct.gov), Connecticut Agricultural Experiment Station, New Haven, CT

D3382 Feeding preference of adults of *Dichelops furcatus* between two corn (*Zea mays*) seedlings with different profiles of volatile organic compounds. **Vanesa Jacobi** (vjacobi@agro.uba.ar)[1], Patricia Fernández[2], María Coll Araoz[3] and Jorge Zavala[1], [1]Univ. de Buenos Aires, Buenos Aires, Argentina, [2]INTA - CONICET, Buenos Aires, Argentina, [3]Planta Piloto de Procesos Industriales Microbiológicos, CONICET, San Miguel de Tucumàn, Argentina

D3383 Identification and confirmation of resistance against soybean aphid (*Aphis glycines*) in eight wild soybean lines. **Louis Hesler** (louis.hesler@ars.usda.gov)[1] and Kelley Tilmon[2], [1]USDA - ARS, Brookings, SD, [2]The Ohio State Univ., Wooster, OH

D3384 Semiochemical repellent strategies for South America palm weevil (*Rhynchophorus palmarum*). **Francisco Zorzenon** (zorzenon@biologico.sp.gov.br)[1], Rodrigo Silva[2], Agenor Mafra-Neto[2], Jesse Saroli[2], Carmem Bernardi[2] and William Urrutia[2], [1]Instituto Biologico, São Paulo, Brazil, [2]ISCA Technologies, Inc, Riverside, CA

D3385 Response of a specialist herbivore, *Hypena opulenta,* to induced defenses of swallow-worts (*Vincetoxicum* spp.). Amelia May, **Lisa Tewksbury** (lisat@uri.edu), Chad Rigsby, Richard Casagrande and Evan L. Preisser, Univ. of Rhode Island, Kingston, RI

D3386 Oviposition preferences of *Plutella xylostella* are influenced by different types of plant induction and volatile profiles. **M. Gabriela Bidart** (gbidart@bgsu.edu) and Tyler Thompson, Bowling Green State Univ., Bowling Green, OH

D3387 Volatile constituents from three date palm cultivars, sugarcane, and pineapple, and antennal response from *Rhynchophorus ferrugineus* Olivier. **Asma Al-Nujiban** (asma-22n@hotmail.com)[1], Saleh A. Aldosari[2], Ali Al Suhaibani[2] and Paraj Shukla[2], [1]Qassim Univ., Qassim, Saudi Arabia, [2]King Saud Univ., Riyadh, Saudi Arabia

D3388 Optimization of placement and contents of *Rhynchophorus ferrugineus* Oliv. pheromone traps in Saudi Arabia. M. M. Abdel-Azim, Saleh A. Aldosari, Polana S. P. V. Vidyasagar and **Paraj Shukla** (parajshukla@gmail.com), King Saud Univ., Riyadh, Saudi Arabia

D3389 The compound (1S)-(–)-verbenone as a potential attractant of *Frankliniella intonsa* on tomato. Bikash Bhusal and **Un Taek Lim** (utlim@andong.ac.kr), Andong National Univ., Andong, South Korea

D3390 Potential value of *Ziziphus jujuba* Mill. as a dual-purpose insectary plant for small-scale farms. **Tessa Grasswitz** (tg359@cornell.edu)[1] and Shengrui Yao[2], [1]Cornell Univ., Albion, NY, [2]New Mexico State Univ., Alcalde, NM

D3391 Johnsongrass and sorghum biotype dependent susceptibility to pest infestation and viral infection. **Peter Klein** (pklein@ksu.edu) and C. Michael Smith, Kansas State Univ., Manhattan, KS

D3392 Harlequin bug movement in response to insect and plant semiochemicals. **Donald C. Weber** (don.weber@ars.usda.gov)[1], Ashot Khrimian[1], Emma Thrift[1], Megan V. Herlihy[1], Guillermo Cabrera Walsh[2], Thomas P. Kuhar[3] and Anna K. Wallingford[3], [1]USDA - ARS, Beltsville, MD, [2]Fundación para el Estudio de Especies Invasivas, Hurlingham, Argentina, [3]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

D3393 Testing baited sticky cards as a sampling method for brown marmorated stink bug in soybean. **Kelley Tilmon** (tilmon.1@osu.edu)[1] and Celeste Welty[2], [1]The Ohio State Univ., Wooster, OH, [2]The Ohio State Univ., Columbus, OH

D3394 Behavioral response of the stored product pest *Tribolium castaneum* to volatiles from traps with prior captures of conspecifics. **Rob Morrison** (william.morrison@ars.usda.gov), Erin Scully and James Campbell, USDA - ARS, Manhattan, KS

D3395 Field and laboratory studies for the development of improved trapping technology for the newly invasive spotted lanternfly, *Lycorma delicatula* (Fulgoridae). **Miriam Cooperband** (miriam.f.cooperband@aphis.usda.gov)[1], Jacob D. Wickham[2], Nathan Derstine[1], Isaiah Canlas[1], John Baker[3], Sven-Erik Spichiger[4] and Daniel Carrillo[5], [1]USDA - APHIS, Buzzards Bay, MA, [2]Chinese Academy of Sciences, Beijing, China, [3]Pennsylvania Dept. of Agriculture, Boyertown, PA, [4]Pennsylvania Dept. of Agriculture, Harrisburg, PA, [5]Univ. of Florida, Homestead, FL

D3396 Bioassay and efficacy of ethanol plant extracts for the management of kola weevil, *Balanogastris kolae* (Coleoptera: Curculionidae), on stored kola nuts. **Juliana Ugwu** (amakajul01@yahoo.com)[1] and Idongesit Mokwunye[2], [1]Forestry Research Institute of Nigeria, Ibadan, Nigeria, [2]Cocoa Research Institute of Nigeria, Ibadan, Nigeria

D3616 Potential kairomones from fungal pathogen (*Amylostereum areolatum*) of *Sirex noctilio* for female wasp parasitoid *Ibalia leucospoides*. **Hajar Faal** (hfaalmoh@syr.edu) and Stephen Teale, State University of New York, Syracuse, NY

Poster: SysEB, Ecology and Disease 1

Mile High Ballroom (Convention Center)

D3397 New species of *Ceratotarsonemus* (Acari: Prostigmata: Tarsonemidae) from Amazon, Brazil. **Jose Rezende** (jmrezende@live.com)[1], Antonio Lofego[2], Ronald Ochoa[3] and Gary R. Bauchan[3], [1]Univ. Estadual Paulista, São Paulo, Brazil, [2]Univ. Estadual Paulista, São José do Rio Preto, Brazil, [3]USDA - ARS, Beltsville, MD

D3398 First record of the genus *Joruma* (Cicadellidae: Typhlocybinae: Empoascini: Jorumina) from Argentina. **María Inés Catalano** (mariainescatalano@unnoba.edu.ar)[1], Stephanie Pereira De Souza[2], Julieta Klimkeit[1] and Christopher H. Dietrich[3], [1]Univ. Nacional del Noroeste de Buenos Aires, Pergamino, Argentina, [2]Univ. Federal do Rio de Janeiro, Rio de Janeiro, Brazil, [3]Univ. of Illinois, Champaign, IL

D3399 Discovery of a remarkable new cave-adapted ant species from Oaxaca, Mexico. **Michael Branstetter** (mgbranstetter@gmail.com)[1] and John Longino[2], [1]Utah State Univ., Logan, UT, [2]Univ. of Utah, Salt Lake City, UT

D3400 *Tyrophagus curvipenis* (Acari: Acaridae), an emerging mite pest: Investigating species boundaries using DNA. **Pamela Murillo** (pammr@umich.edu), Pavel B. Klimov and Barry O'Connor, Univ. of Michigan, Ann Arbor, MI

D3401 Population genomics of potato psyllids in the Pacific Northwest. **Zhen Fu** (zhen.fu@wsu.edu) and William Snyder, Washington State Univ., Pullman, WA

D3402 Natural hybridization between *Helicoverpa armigera* and *Helicoverpa zea* (Lepidoptera: Noctuidae) in Brazil and gene flow in the Americas. **Natália Leite** (alvesnat@gmail.com)[1], Alberto Correa[2], Andrew Michel[3], Alessandro Alves-Pereira[2], Vitor A. C. Pavinato[3], Maria I. Zucchi[4] and Celso Omoto[2], [1]Embrapa Milho e Sorgo, Sete Lagoas, Brazil, [2]Univ. de São Paulo, Piracicaba, Brazil, [3]The Ohio State Univ., Wooster, OH, [4]Agribusiness Technological Development of São Paulo, Piracicaba, Brazil

D3403 A study of the Neotropical Oscinellinae (Diptera: Chloropidae), with a comparative analysis of the genera from all biogeographical regions as a framework for a phylogeny of the subfamily. **Zeinab Bazyar** (s.z.e.bazyar@gmail.com), Univ. Estadual Paulista, Ribeirão Preto, Brazil

D3404 Community composition, functional traits, and functional diversity of ladybeetles (Coleoptera: Coccinellidae) in urban community gardens. **Heidi Liere** (heliere@reed.edu)[1], Monika Egerer[2], Shalene Jha[3], Brenda Lin[4] and Stacy M. Philpott[2], [1]Reed College, Portland, OR, [2]Univ. of California, Santa Cruz, CA, [3]Univ. of Texas, Austin, TX, [4]CSIRO, Aspendale, Australia

D3405 Cryptic east-west divergence in two species of North American *Leucopis* (Diptera: Chamaemyiidae) being evaluated for biological control of hemlock woolly adelgid (*Adelges tsugae*: Hemiptera: Adelgidae). **Nathan Havill** (nphavill@fs.fed.us)[1] and Stephen D. Gaimari[2], [1]USDA - Forest Service, Hamden, CT, [2]Plant Pest Diagnostics Branch, Sacramento, CA

D3406 Temporal diversity of field collected scarab (Coleoptera: Scarabaeidae: Melolonthinae) adults in central Illinois. **Robert W. Behle** (robert.behle@ars.usda.gov) and Christopher Dunlap, USDA - ARS, Peoria, IL

D3407 A comparison of arthropod diversity and abundance along four elevational gradients in Colorado for ants (Hymenoptera: Formicidae), beetles (Coleoptera), and grasshoppers (Orthoptera: Caelifera). **Christy McCain** (christy.mccain@colorado.edu), Tim Szewczyk, Cesar Nufio and Andrew Hicks, Univ. of Colorado, Boulder, CO

D3408 Ant biodiversity for sites at two elevations in the northern Black Hills. **Jessie Clark** (jessie.clark@yellowjackets.bhsu.edu) and Holly Downing, Black Hills State Univ., Spearfish, SD

D3409 Support for the species-energy theory: Carrion beetle (Silphidae) abundance and diversity are positively related small mammal abundance. **Tyler Streb** (tyler.streb@Colorado.edu) and Christy McCain, Univ. of Colorado, Boulder, CO

D3410 Biodiversity, abundance, and distribution of night-flying insects in a multi-use tallgrass ecosystem. **Carrie Hall** (carrie.hall@unh.edu) and Daniel Howard, Univ. of New Hampshire, Durham, NH

D3411 Ecosystem in a box - Arthropod communities in great tit nests along an urbanization gradient. **Lisa Furu Baardsen** (lisafuru.baardsen@uantwerpen.be), Univ. of Antwerp, Antwerp, Belgium

D3412 Initial biodiversity of arthropods available to song birds in an Arctic tundra. **Kathleen Schnaars Uvino** (kituvino@gmail.com)[1] and Joy Newton[2], [1]Univ. of Jamestown, Jamestown, ND, [2]Univ. of Nevada, Yerington, NV

D3413 A summary of fruit fly (Diptera: Tephritidae: Dacinae) surveys in Asia (2011-2017). **Luc Leblanc** (leblancl@uidaho.edu)[1], Bishnu Bhandari[2], M. Aftab Hossain[3], Daniel Rubinoff[2] and Michael San Jose[2], [1]Univ. of Idaho, Moscow, ID, [2]Univ. of Hawai'i, Honolulu, HI, [3]Atomic Energy Research Establishment, Dhaka, Bangladesh

D3414 A trait-based approach in understanding ant community assembly in the Soutpansberg Mountain, South Africa. **Mulalo Muluvhahothe** (mulalomary@gmail.com)[1], Thinandavha Munyai[2] and Stefan Foord[1], [1]Univ. of Venda, Thohoyandou, South Africa, [2]Univ. of KwaZulu-Natal, Pietermaritzburg, South Africa

D3415 Results from a survey in south Florida for the avocado seed moth (ASM), *Stenoma catenifer* Walsingham (Lepidoptera). **Julieta Brambila** (julieta.brambila@aphis.usda.gov)[1], James Hayden[2], Daniel Carrillo[3] and Amy L. Roda[4], [1]USDA - APHIS, Gainesville, FL, [2]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL, [3]Univ. of Florida, Homestead, FL, [4]USDA - APHIS, Miami, FL

D3416 Phlebotomine sandflies in Thailand: More caves reveal more species. **Andreas Krüger** (krueger@bnitm.de)[1], Sandra Oerther[2], Jonas Schmidt-Chanasit[2] and Renke Lühken[2], [1]Bundeswehr Hospital Hamburg, Hamburg, Germany, [2]Bernhard Nocht Institute for Tropical Medicine, Hamburg, Germany

D3417 *Wolbachia* infection frequency and evolution among mosquito (Culicidae) species. **Rebekah Williams** (rwilliams17@ggc.edu) and James Russell, Georgia Gwinnett College, Lawrenceville, GA

D3418 The Criocerinae Latreille of Nebraska and known host plant relationships (Coleoptera: Chrysomelidae). **Lance J. Meinke** (lmeinke1@unl.edu), Univ. of Nebraska, Lincoln, NE

D3419 Braconidae of Plummers Island and comparison of the fauna in canopy and understory. **Jennifer Pierce** (jenpierce01@gmail.com)[1,2], Michael Parak[3] and Robert R. Kula[4], [1]Hood College, Frederick, MD, [2]Smithsonian Institution, Washington, DC, [3]Slovak Academy of Sciences, Zvolen, Slovakia, [4]USDA - ARS, Washington, DC

D3614 Monitoring insect diversity in backyard swimming pools with citizen scientists. **Jenna Florio** (jflorio@calacademy.org)[1], Brian L. Fisher[1] and Neil Tsutsui[2], [1]California Academy of Sciences, San Francisco, CA, [2]Univ. of California, Berkeley, CA

Poster: SysEB, Structure and Function

Mile High Ballroom (Convention Center)

D3420 The molecular evolutionary dynamics of Oxidative Phosphorylation (OXPHOS) genes in insects. **Yiyuan Li** (yli19@nd.edu)[1], Rui Zhang[2], Shanlin Liu[2], Alexander Donath[3], Ralph S. Peters[3], Jessica Ware[4], Bernhard Misof[3], Oliver Niehuis[5], Xin Zhou[6] and Michael Pfrender[1], [1]Univ. of Notre Dame, Notre Dame, IN, [2]China National GeneBank, Shenzhen, China, [3]Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany, [4]Rutgers, The State Univ. of New Jersey, Newark, NJ, [5]Univ. of Freiburg, Hauptstr, Germany, [6]China Agricultural Univ., Beijing, China

D3421 Structural diversity of the metendosternite in flightless Tenebrionidae. **M. Andrew Johnston** (ajohnston@asu.edu), Arizona State Univ., Tempe, AZ

D3422 Postembryonic development of the tracheal system of holometabolous insects in context of aptery. Marcin Raś, **Marcin Kaminski** (mkaminski@miiz.waw.pl) and Dariusz Iwan, Polish Academy of Sciences, Warsaw, Poland

D3423 Studying the click-beetle self-righting jump mechanics and dynamics as a design guide for a bio-inspired innovative robot. **Ophelia Bolmin** (obolmin2@illinois.edu)[1], Alexander Hazel[1], Luis Urrutia[1], Aidan Garrett[2], Isandro Malik[2], Ahmad Abdulla[1], Chengfang Duan[1], Roberto Chapa[1], Alison Dunn[1], Aimy Wissa[1] and Marianne Alleyne[1], [1]Univ. of Illinois, Champaign, IL, [2]Univ. Laboratory High School, Urbana, IL

D3424 Unraveling the mysteries of nature's finest silks (Order Embioptera). **Janice S. Edgerly** (jedgerlyrooks@scu.edu), Grace Stokes, Evangelea DiCicco and Richard Barber, Santa Clara Univ., Santa Clara, CA

D3425 Genetic characterization of chemosensation in a terrestrial isopod: Evolution of olfaction in woodlice. **Carla Yost** (cyost@highpoint.edu) and Jackson Sparks, High Point Univ., High Point, NC

D3426 Evolutionary history of minute litter bugs (Hemiptera: Dipsocoromorpha) based on morphological and molecular data. **Alexander Knyshov** (aknys001@ucr.edu)[1], Sile Du[2], Rochelle Hoey-Chamberlain[1], Sarah Frankenberg[1], Juanita Rodriguez[3] and Christiane Weirauch[1], [1]Univ. of California, Riverside, CA, [2]Capital Normal Univ., Beijing, China, [3]Pontificia Univ. Javeriana, Bogotá, Colombia

D3427 Flash behavior of *Photuris* fireflies in western North America. **Lawrent Buschman** (lbuschma@ksu.edu), Kansas State Univ., Bailey, CO

D3428 *Aphanogmus* male genitalia and confocal laser scanning microscopy. **István Mikó** (istvan.miko@gmail.com), Jonah Ulmer, Joyce Sakamoto and Andrew Deans, Pennsylvania State Univ., University Park, PA

Virtual Poster: PBT

Mile High Ballroom (Convention Center)

VP37 Behavioral response to different fixed oils obtained by supercritical fluid extraction in the medfly *Ceratitis capitata* (Wiedemann) (Diptera: Tephritidae). Antonella Rosa, Alessandra Piras, Gianfranca Carta, Paolo Solari, Roberto Crnjar and **Carla Masala** (cmasala@unica.it), Univ. of Cagliari, Monserrato, Italy

VP38 From vector pest to nutrition source - Identification and testing of oviposition attractant chemical compounds for *Musca domestica*. **Rui Tang** (r.tang@cabi.org)[1,2,3], Feng Zhang[1,2], N'Golopé Kone[4], Jing-Hua Chen[5], Fen Zhu[6], Ri-Chou Han[7], Chao-Liang Lei[6], Marc Kenis[8], Ling-Qiao Huang[3] and Chen-Zhu Wang[3], [1]CAB International, Beijing, China, [2]MoA-CABI Joint Laboratory for Bio-safety, Beijing, China, [3]Chinese Academy of Sciences, Beijing, China, [4]Institut D'Economie Rurale, Bamako, Mali, [5]Lvbenyuan Biotech Company Ltd, Guangzhou, China, [6]Huazhong Agricultural Univ., Wuhan, China, [7]Chinese Academy of Sciences, Guangzhou, China, [8]CABI, Delémont, Switzerland

VP39 Midgut trypsins participate in adaptation of the Indian eri silkworm, *Samia ricini* Anderson to host plants *Ricinus communis* L. and *Ailanthus excelsa* Roxb. Sochanngam Kashung, Parul Bhardwaj, Mahaswetta Saikia and **Sudeshna Mazumdar-Leighton** (smazumdar@botany.du.ac.in), Univ. of Delhi, New Delhi, India

VP40 The function of CLSP2 involved in the modulation of antifungal immune response in mosquito *Aedes aegypti*. **Yanhong Wang** (wangyanhong@ioz.ac.cn), Hong Jiang and Zhen Zou, Institute of Zoology Chinese Academy of Sciences, Beijing, China

VP41 RNA interference of trehalose phosphate synthase affects survival under cold treatment. **Wook Hyun Cha** (whcha17@gmail.com)[1], Youngjin Park[2], Yonggyun Kim[2] and Dae-weon Lee[1], [1]Kyungsung Univ., Busan, South Korea, [2]Andong National Univ., Andong, South Korea

VP42 Metabolic regulation of adult reproductive diapause in *Drosophila suzukii* (Diptera: Drosophilidae) females. **Yi Yu** (robertyuyi@163.com)[1], Yi-Fan Zhai[1], Xiao-Lin Dong[2], Huan-Huan Gao[1], Hao Chen[1], Meng Sun[1] and Li Zheng[1], [1]Shandong Academy of Agricultural Sciences, Jinan, China, [2]Yangtze Univ., Jingzhou, China

VP43 Repellents provide an innovative approach to managing stored product pests in insecticide-treated bags. **Allan Mortensen** (amo@vestergaard.com)[1], Georgina Bingham[1], Troy Anderson[2] and Leslie Rault[2], [1]Vestergaard S. A., Lausanne, Switzerland, [2]Univ. of Nebraska, Lincoln, NE

Virtual Poster: SysEB

Mile High Ballroom (Convention Center)

VP44 Utilization of green background in comparative morphology of insects. **Martin Novak** (novak22@fzp.czu.cz), Pavel Jakubec, Jarin Qubaiova and Jan Ruzicka, Czech Univ. of Life Sciences, Prague, Czech Republic

VP45 Necrophagous beetles (Coleptera) in forensic entomology: Determination and developmental models. **Jarin Qubaiova** (qubaiova@fzp.czu.cz)[1], Pavel Jakubec[1], Martin Novak[1], Hana Šuláková[2] and Jan Ruzicka[1], [1]Czech Univ. of Life Sciences, Prague, Czech Republic, [2]Institute of Criminalistics, Prague, Czech Republic

VP46 Morphology of the larva of *Nicrophorus nepalensis* (Coleoptera: Silphidae). **Jan Ruzicka** (ruzickajan@fzp.czu.cz), Hana Sipkova, Pavel Jakubec, Martin Novak and Jarin Qubaiova, Czech Univ. of Life Sciences, Prague, Czech Republic

VP47 Effect of a short adaptive pre-feeding on the predatory functional response to *Orius sauteri* reared on *Sitotroga cerealella* eggs. **Yi Yu** (robertyuyi@163.com), Bing Lü, Meng Sun, Yi-Fan Zhai, Hao Chen and Li Zheng, Shandong Academy of Agricultural Sciences, Jinan, China

VP48 Community structure and indicator species selection of soil predatory mites in forest ecosystem. **Eunsun Keum** (kes0222es@gmail.com) and Chuleui Jung, Andong National Univ., Andong, South Korea

VP49 The effect of vegetation management on electric transmission rights-of-way on bees: A case study in central Pennsylvania. **Hannah Stout** (e.guttulata@gmail.com)[1], Laura Russo[2], Dana Roberts[3] and Carolyn Mahan[4], [1]Independent Researcher, State College, PA, [2]Trinity College, Dublin, Ireland, [3]Pennsylvania State Univ., University Park, PA, [4]Pennsylvania State Univ., Altoona, PA

VP50 The Ants of Virginia Project. **Kaloyan Ivanov** (antzmail@gmail.com), Joe B. Keiper and Liberty Hightower, Virginia Museum of Natural History, Martinsville, VA

VP51 Genus delimitation, biogeography and diversification of *Choristoneura* Lederer, 1859 (Lepidoptera: Tortricidae) based on molecular evidence. **Giovanny Fagua** (faguagon@ualberta.ca)[1] and Felix Sperling[2], [1]Pontificia Univ. Javeriana, Bogota, Colombia, [2]Univ. of Alberta, Edmonton, AB, Canada

VP52 Morphology of *Thanatophilus rugosus* larvae. **Pavel Jakubec** (jakubecp@fzp.czu.cz)[1], Martin Novak[1], Jarin Qubaiova[1], Hana Šuláková[2] and Jan Ruzicka[1], [1]Czech Univ. of Life Sciences, Prague, Czech Republic, [2]Institute of Criminalistics, Prague, Czech Republic

VP53 Can we predict Antarctic alien invertebrate invasions by characterizing physiological climatic niches? The case of sub-Antarctic native midge *Eretmoptera murphyi.* **Luis R. Pertierra** (luis.pertierra@mncn.csic.es)[1], Jesamine Bartlett[2], Kevin Hughes[3], Greta Vega[4], Miguel Olalla-Tarraga[4], Scott Hayward[2], Pete Convey[3] and Pedro Aragon[1], [1]Museo Nacional de Ciencias Naturales, Madrid, Spain, [2]Univ. of Birmingham, Birmingham, United Kingdom, [3]British Antarctic Survey, Cambridge, United Kingdom, [4]Univ. Rey Juan Carlos, Mostoles, Spain

HIGHLIGHTED POSTERS & VIRTUAL POSTERS

Highlighted Posters and Virtual Posters displayed throughout the week will be the same as those listed on Sunday, D3000-D3007 and VP01-VP02. See page 134 for titles and authors.

Tuesday, November 7, 2017 • MORNING

Awards Breakfast Featuring the Founders' Memorial Lecture

Four Seasons Ballroom (Convention Center)

Moderators and Organizers: Susan J. Weller[1], C. David Gammel[2] and Carol Anelli[3], [1]Univ. of Nebraska, Lincoln, NE, [2]Entomological Society of America, Annapolis, MD, [3]The Ohio State Univ., Columbus, OH

7:30 **Breakfast**

7:50 **Awards Program**

8:20 **0972** ESA Founders' Memorial Lecture: With usual daring on untried paths: Anna Botsford Comstock—Educational trailblazer, author, and scientific illustrator. **Carol Anelli** (anelli.7@osu.edu), The Ohio State Univ., Columbus, OH

8:50 **Concluding Remarks**

MUVE Section Symposium: Innovations in Disease Management: Integrating Entomology and Community Engagement

Meeting Room 710/712 (Convention Center)

Moderators and Organizers: Tanya Josek[1] and Allison Gardner[2], [1]Univ. of Illinois, Champaign, IL, [2]Univ. of Maine, Orono, ME

9:00 **Introductory Remarks**

9:05 **0973** What would you say is causing the increase in deer ticks? Views from the unbridged islands of Maine, USA. **Susan Elias** (eliass@mmc.org)[1], Benjamin Stone[1], Mirk Maasch[2], Laura Rickard[2], Charles Lubelczyk[1], Peter Rand[1], Robert Smith[1], Eleanor Lacombe[1], Norman Anderson[3] and Sara Robinson[4], [1]Maine Medical Center Research Institute, Scarborough, ME, [2]Univ. of Maine, Orono, ME, [3]Anderson Environmental Health, Winslow, ME, [4]Maine Centers for Disease Control and Prevention, Augusta, ME

9:20 **0974** The Haller's organ, a new paradigm on form and function. **Ann Carr** (ann.carr@partners.basf.com)[1], Robert Mitchell[1], Anirudh Dhammi[1], Brooke Bissinger[2], Daniel Sonenshine[3] and R. Michael Roe[1], [1]North Carolina State Univ., Raleigh, NC, [2]AgBiome, Inc, Research Triangle Park, NC, [3]Old Dominion Univ., Norfolk, VA

9:35 **0975** Ecological and socioeconomic perspectives on risk of juvenile mosquitoes in container habitats. **Allison Parker** (aparker9@illinois.edu)[1], Allison Gardner[2] and Brian F. Allan[1], [1]Univ. of Illinois, Champaign, IL, [2]Univ. of Maine, Orono, ME

9:50 **0976** Managing the landscape of arboviral risk in temperate cities. **Shannon L. LaDeau** (ladeaus@caryinstitute.org)[1], Dawn Biehler[2], Rebecca Jordan[3] and Paul T. Leisnham[4], [1]Cary Institute of Ecosystem Studies, Millbrook, NY, [2]Univ. of Maryland, Catonsville, MD, [3]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [4]Univ. of Maryland, College Park, MD

10:05 **0977** A trait-based framework for understanding and predicting the transmission of vector-borne infections: Perspectives from the VectorBiTE RCN. **Leah Johnson** (lrjohn@vt.edu)[1], Lauren Cator[2], Samraat Pawar[2], Erin Mordecai[3] and Peter Hudson[4], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Imperial College of London, London, United Kingdom, [3]Stanford Univ., Stanford, CA, [4]Pennsylvania State Univ., University Park, PA

10:20 **Break**

10:35 **0978** The Tick Project: Testing environmental interventions to prevent tick-borne diseases in residential neighborhoods. **Felicia Keesing** (keesing@bard.edu)[1] and Richard Ostfeld[2], [1]Bard College, Annandale, NY, [2]Cary Institute of Ecosystem Studies, Millbrook, NY

10:50 **0979** It's about Lyme: Incorporation of research on tick biology and Lyme disease into the high school classroom. **Tanya Josek** (tanyajosek@gmail.com)[1], Natasha Capell[2] and Barbara Hug[1], [1]Univ. of Illinois, Champaign, IL, [2]Tuscola High School, Tuscola, IL

11:05 **0980** The Invasive Mosquito Project: Success, failures and lessons learned from a national citizen science mosquito monitoring program. **Lee Cohnstaedt** (lee.cohnstaedt@ars.usda.gov), USDA - ARS, Manhattan, KS

11:20 **0981** A two-way street: Can pairing personalized risk messages with passive tick surveillance improve prevention behaviors? **Heather L. Kopsco** (hkopsco@uri.edu), Roland J. Duhaime, Brian Mullen and Thomas N. Mather, Univ. of Rhode Island, Kingston, RI

11:35 **Discussion**

PBT Section Symposium: Insecticide Science in the 21st Century: The Age of Increased Targets, Resistance, and Biorational Insecticides

Meeting Room 603 (Convention Center)

Moderators and Organizers: Daniel R. Swale[1] and Aaron Gross[2], [1]Louisiana State Univ., Baton Rouge, LA, [2]Univ. of Florida, Gainesville, FL

9:00 **Welcoming Remarks**

9:05 **0982** Perspectives on agrochemical discovery: Innovation highlights in insecticidal research. **Thomas Sparks** (tcsparks@dow.com), Gerald B. Watson and Beth Lorsbach, Dow AgroSciences, Indianapolis, IN

9:35 **0983** Inscalis™ insecticide (Afidopyropen) is a novel chordotonal organ modulator. **Vincent Salgado** (vincent.salgado@basf.com)[1], Ramani Kandasamy[1], Katherine Lelito[1], Brecht London[1], Lynn Stam[1], Wolfgang von Deyn[2], Xilong Zhao[1] and Alexandre Nesterov[1], [1]BASF Corporation, Research Triangle Park, NC, [2]BASF SE, Ludwigshafen, Germany

9:50 **0984** Toxicity, repellency, and physiological actions of low molecular weight basic amines. **Jeffrey Bloomquist** (jbquist@epi.ufl.edu)[1], Aaron Gross[1], Baonan Sun[1], Minyuan Tie[1], Liu Yang[1] and Ulrich Bernier[2], [1]Univ. of Florida, Gainesville, FL, [2]USDA - ARS, Gainesville, FL

10:05 **0985** Muscarinic acetylcholine receptors: Underutilized targets for mosquito control. **Aaron Gross** (adgross@epi.ufl.edu)[1,2], Paul R Carlier[2] and Jeffrey Bloomquist[1], [1]Univ. of Florida, Gainesville, FL, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

10:20 **0986** Targeting K+ ion channels in the arthropod salivary gland as a target for vector control and pathogen mitigation. **Daniel R. Swale** (dswale@agcenter.lsu.edu), Louisiana State Univ., Baton Rouge, LA

10:35 **0987** Mechanisms underlying resistance to novel complex II inhibitors in *Tetranychus urticae*. **Thomas Van Leeuwen** (thomas.vanleeuwen@ugent.be)[1], Nena Pavlidi[2], Mousaalreza Khalighi[1], Maria Riga[3], Nicky Wybouw[2], John Vontas[4] and Wannes Dermauw[1], [1]Ghent Univ., Ghent, Belgium, [2]Univ. of Amsterdam, Amsterdam, Netherlands, [3]Univ. of Crete, Crete, Greece, [4]Agricultural Univ. of Athens, Athens, Greece

10:50 **0988** Contribution of individual mutations, genes and mechanisms in insecticide resistance. **John Vontas** (vontas@imbb.forth.gr)[1], Vassilis Douris[2], Linda Grigoraki[2], Vasileia Balabanidou[3], Maria Riga[4], Thomas Van Leeuwen[5] and Ralf Nauen[6], [1]Agricultural Univ. of Athens, Athens, Greece, [2]Foundation for Research and Technology Hellas-IMBB, Heraklion, Greece, [3]Univ. of Crete, Heraklion, Greece, [4]Univ. of Crete, Crete, Greece, [5]Ghent Univ., Ghent, Belgium, [6]Bayer AG, Monheim, Germany

11:05 **Break**

11:15 **0989** Spatial repellents: An expanded view of their impact on vector populations. **John Greico** (jgrieco@nd.edu) and Nicole L. Achee, Univ. of Notre Dame, Notre Dame, IN

11:30 **0990** Targeting the chemical senses in insect and mite pests. **Erika Plettner** (plettner@sfu.ca)[1], Mailyn Terrado[1], Govardhana Pinnelli[1], Christopher Keeling[1], Nurit Eliash[2], Nitin Singh[2] and Victoria Soroker[3], [1]Simon Fraser Univ., Burnaby, BC, Canada, [2]Agricultural Research Organization, Bet Dagan, Israel, [3]Agricultural Research Organization, Bet-Dagan, Israel

11:45 **0991** Molecular basis of pyrethroid repellency. Peng Xu[1], Qiang Wang[1], Feng Liu[1], Elizabeth Bandason[1], Yoshiko Nomura[1], Shaoying Wu[1], Yuzhe Du[1], Leticia Smith[2], Jeffrey G. Scott[2], Kamlesh R. Chauhan[3] and **Ke Dong** (dongk@cns.msu.edu)[1], [1]Michigan State Univ., East Lansing, MI, [2]Cornell Univ., Ithaca, NY, [3]USDA - ARS, Beltsville, MD

12:00 **0992** Insecticidal activity of plant essential oils and enhanced permethrin toxicity against *Aedes aegypti*. **Jun-hyung Tak** (saturnpg7@yahoo.com) and Jeffrey Bloomquist, Univ. of Florida, Gainesville, FL

12:15 **0993** Toxicity and repellency of a Madagascan medicinal plant (*Cinnamosma fragrans*) and its major secondary metabolite against mosquitoes. **Peter Piermarini** (piermarini.1@osu.edu)[1], Edna Inocente[1], Marguerite Shaya[1] and Liva Rakotondraibe[2], [1]The Ohio State Univ., Wooster, OH, [2]The Ohio State Univ., Columbus, OH

12:30 **0994** Oxitec mosquitoes: A tool for effective integrated pest management. **Jennina Taylor-Wells** (jennina.taylor-wells@oxitec.com), Oxitec Ltd, Abingdon, United Kingdom

12:45 **0995** Strategies for enhancing oral RNAi efficiency in the European corn borer. **Anastasia Cooper** (anacooper@ksu.edu) and Kun Yan Zhu, Kansas State Univ., Manhattan, KS

PBT Section Symposium: Mitochondria, Metabolism, and Homeostasis: From Molecular Mechanisms to Societies

Meeting Room 301 (Convention Center)

Moderators and Organizers: Clare Rittschof[1] and Jonathan Snow[2], [1]Univ. of Kentucky, Lexington, KY, [2]Columbia Univ., New York, NY

9:00 **0996** Impact of cellular stress on metabolism in honey bees. **Jonathan Snow** (jsnow@barnard.edu), Columbia Univ., New York, NY

9:15 **0997** Polymorphism in a metabolic enzyme that affects mitochondrial function, HIF pathway signaling, aging, and metapopulation dynamics in an ecological model insect. **James H. Marden** (jhm10@psu.edu), Erica Shearer and Howard W. Fescemyer, Pennsylvania State Univ., University Park, PA

9:30 **0998** A broad-scale comparative view of mitochondrial respiration: Effects of temperature from biochemical reactions to whole organisms. **James Gilooly** (gillooly@ufl.edu), Univ. of Florida, Gainesville, FL

9:45 **0999** Mitonuclear interactions influence performance and fitness characters along elevation gradients in a montane insect. **Nathan E. Rank** (rank@sonoma.edu)[1] and Elizabeth P. Dahlhoff[2], [1]Sonoma State Univ., Rohnert Park, CA, [2]Santa Clara Univ., Santa Clara, CA

10:00 **Break**

10:20 **1000** Mitochondrial functional plasticity and behavioral regulation. **Clare Rittschof** (clare.rittschof@uky.edu), Univ. of Kentucky, Lexington, KY

10:35 **1001** Divergence in mitochondrial function underlies life history specialization in wing polymorphic crickets. Caroline M. Williams, Lisa Treidel and **Rebecca Clark** (r11clark@gmail.com), Univ. of California, Berkeley, CA

10:50 **1002** Impacts of recent climate warming on insect metabolism. **Michael E. Dillon** (michael.dillon@uwyo.edu)[1], Steven Chown[2] and Raymond Huey[3], [1]Univ. of Wyoming, Laramie, WY, [2]Monash Univ., Victoria, Australia, [3]Univ. of Washington, Seattle, WA

11:05 **1003** Mitochondia and the physiological responses to changes in diet. **Norbert Perrimon** (perrimon@genetics.med.harvard.edu), Harvard Medical School, Boston, MA

11:35 **Discussion**

P-IE Section Symposium in Honor of Larry Larson: Crops and Pollinators: Causes of Decline and Solutions for Improving Pollinator Health and Delivering on Crop Production

Meeting Room 707 (Convention Center)

Moderators and Organizers: Luis E. Gomez[1] and Melissa Willrich Siebert[2], [1]Dow AgroSciences, Indianapolis, IN, [2]Dow AgroSciences, Greenville, MS

9:00 **Introductory Remarks**

9:05 **1004** A commercial beekeepers perspective on pesticides & bee losses. **Eric Olson** (eric@olsonshoney.com), Olson's Honey, Yakima, WA

9:35 **1005** Overwintering and genetic variability of honey bees and their effect on bee decline and solutions for improving. **Walter Sheppard** (shepp@wsu.edu), Washington State Univ., Pullman, WA

9:50 **1006** Pollinators, pathogens, and parasites: Improving bee health through integrated pest and pollinator management (IPPM). **Diana Cox-Foster** (diana.cox-foster@ars.usda.gov), USDA - ARS, Logan, UT

10:05 **1007** North Dakota pollinator plan. **Samantha Brunner** (sbrunner@nd.gov), North Dakota Dept. of Agriculture, Bismarck, ND

10:20 **1008** The North America Bayer bee care program. **Ana Cabrera** (ana.cabrera@bayer.com) and Stephanie Darnell, Bayer CropScience, Research Triangle Park, NC

10:35 **1009** Challenges of assessing exposure of crop protection product to insect pollinators. **Joseph Wisk** (joseph.wisk@basf.com)[1], Nicole Hanewald[2], Christof Schneider[2] and Rajwinder Singh[1], [1]BASF Corporation, Research Triangle Park, NC, [2]BASF SE, Limburgerhof, Germany

10:50 **Panel Discussion**

P-IE Section Symposium: Applied Chemical Ecology and Biocontrol for Invasive Species

Meeting Room 705 (Convention Center)

Moderators and Organizers: Nicole Quinn[1] and Rob Morrison[2], [1]Virginia Polytechnic Institute and State Univ., Winchester, VA, [2]USDA - ARS, Manhattan, KS

9:00 **1010** Oviposition behavior of spotted wing drosophila. **Kevin Rice** (ricekevinb@gmail.com) and Tracy C. Leskey, USDA - ARS, Kearneysville, WV

9:15 **1011** Potential biological control of the spotted wing drosophila – Parasitoid behavior to screen for non-target risks. **Kent Daane** (kdaane@ucanr.edu)[1], Antonio Biondi[2], Xingeng Wang[3], Lucia Zappalà[2], Vaughn Walton[4] and Kim Hoelmer[5], [1]Univ. of California, Parlier, CA, [2]Univ. of Catania, Catania, Italy, [3]Univ. of California, Berkeley, CA, [4]Oregon State Univ., Corvallis, OR, [5]USDA - ARS, Newark, DE

9:30 **1012** Maternal learning improves offspring fitness in a phytopathogen vector. **Dara Stockton** (dara.stockton@ufl.edu), Xavier Martini and Lukasz Stelinski, Univ. of Florida, Lake Alfred, FL

9:45 **Break**

10:00 **1013** Habitat management for conservation biocontrol of a stem mining fly. **Amanda Buchanan** (alynn@msu.edu), Adam Ingrao and Zsofia Szendrei, Michigan State Univ., East Lansing, MI

10:15 **1014** Colonization, dispersal, and impact of *Laricobius osakensis* Montgomery and Shiyake (Coleoptera: Derodontidae), as a biological control agent of the hemlock woolly adelgid, *Adelges tsugae* Annand. **Ashley Toland** (ashleyat@vt.edu) and Scott Salom, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

10:30 **1015** Coordinating the statewide implementation of a biological control of weeds program. **Carey Minteer** (c.minteerkillian@ufl.edu)[1], Ken Gioeli[1], Christopher Kerr[2], Min Rayamajhi[3] and William Overholt[1], [1]Univ. of Florida, Fort Pierce, FL, [2]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL, [3]USDA - ARS, Fort Lauderdale, FL

10:45 **Round Table Discussion**

P-IE Section Symposium: Entomological Engineering: Tracking, Stimulation, and Detection of Insects

Meeting Room 404 (Convention Center)

Moderators and Organizers: Barukh Rohde[1] and Richard Mankin[2], [1]Univ. of Florida, Gainesville, FL, [2]USDA - ARS, Gainesville, FL

9:00 **1016** Acoustic detection of the Asian longhorned beetle, *Anoplophora glabripennis* (Coleoptera: Cerambycidae) in urban maples under quarantine. **Richard Mankin** (richard.mankin@ars.usda.gov)[1], Barukh Rohde[2], Avraham-Nachum Brun-Kestler[3], Jacob D. Wickham[4] and Muhammad Haseeb[5], [1]USDA - ARS, Gainesville, FL, [2]Univ. of Florida, Gainesville, FL, [3]Custom Engineered Solutions, West Hempstead, NY, [4]Chinese Academy of Sciences, Beijing, China, [5]Florida A&M Univ., Tallahassee, FL

9:15 **1017** The development of a male *Aedes aegypti* sound trap (MAST) to track sterile & genetically transformed insect releases. **Barukh Rohde** (barukh94-school@yahoo.com)[1], Nicholas Zeak[1], Scott Ritchie[2] and Richard Mankin[3], [1]Univ. of Florida, Gainesville, FL, [2]James Cook Univ., Cairns, Australia, [3]USDA - ARS, Gainesville, FL

9:30 Presentation withdrawn

9:45 **1019** The three dimensions: Pests, people, and printing - The future in 3D. **James Snyder** (james.snyder@freshfromflorida.com)[1], Anthony Dickens[1], Chandrika Ramadugu[2], Susan Halbert[1], Shweta Sharma[1], Amy Howe[1], Eric Rohrig[1] and Trevor Smith[1], [1]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL, [2]Univ. of California, Riverside, CA

10:00 **Demo Time: 3D-printed insect traps**

10:05 **1020** Using microcontrollers to study emergence rhythms of the alfalfa leafcutting bee, *Megachile rotundata*. **Meghan Bennett** (meghan.bennett@ndsu.edu)[1], Joseph P. Rinehart[2], George Yocum[2] and Kendra Greenlee[1], [1]North Dakota State Univ., Fargo, ND, [2]USDA - ARS, Fargo, ND

10:20 **Demo time: Automated bee emergence sensing**

10:25 **1021** Using mobile phones as networked acoustic sensors for high-throughput crowd-sourced surveillance of mosquito ecology. **Haripriya Mukundarajan** (haripria@stanford.edu), Felix Hol, Erica Castillo, Cooper Newby and Manu Prakash, Stanford Univ., Stanford, CA

10:40 **1022** Automatic insect recognition using optical flight dynamics modeled by finite state machines. **Kan Li** (mail.kan@gmail.com) and Jose Principe, Univ. of Florida, Gainesville, FL

10:55 **Discussion**

P-IE Section Symposium: Finding Common Ground: Comparing Pollinator and Natural Enemy Community Responses to Land Management Practices

Meeting Room 709 (Convention Center)

Moderators and Organizers: Gina Angelella[1], Heather Grab[2] and Megan E. O'Rourke[3], [1]Virginia Polytechnic Institute and State Univ., Painter, VA, [2]Cornell Univ., Ithaca, NY, [3]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

9:00 **1023** Lessons learned from establishing wildflower plantings for wild bee conservation near perennial fruit crops in Michigan. **Julianna Wilson** (jkwilson@msu.edu)[1], Rufus Isaacs[1], Thomas Wood[1] and Jason Gibbs[2], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Manitoba, Winnipeg, MB, Canada

9:15 **1024** Temporal resource pulse decreases bumble bee foraging duration across central Wisconsin agricultural landscapes. **Jeremy Hemberger** (j.hemberger.wisc@gmail.com) and Claudio Gratton, Univ. of Wisconsin, Madison, WI

9:30 **1025** What promotes predator community evenness in agroecosystems? **Carmen K. Blubaugh** (carmen.blubaugh@wsu.edu) and William Snyder, Washington State Univ., Pullman, WA

9:45 **1026** A growing conservation focus in shrinking cities: How vacant land management influences bee communities. **Mary Gardiner** (gardiner.29@osu.edu)[1], Scott Prajzner[2], Katherine Todd[1] and Frances S. Sivakoff[1], [1]The Ohio State Univ., Columbus, OH, [2]The Ohio State Univ., Wooster, OH

10:00 **1027** Investigating ecosystem services of insect communities in California annual grasslands. **C. Sheena Sidhu** (cssidhu@ucanr.edu)[1], Philip Brownsey[2], Viriginia L. J. Bolshakova[3], Theresa Becchetti[4] and Jeremy James[2], [1]Univ. of California, Half Moon Bay, CA, [2]Sierra Foothills Research and Extension Center, Browns Valley, CA, [3]Purdue Univ., West Lafayette, IN, [4]Univ. of California, Modesto, CA

10:15 **1028** Plant selection to support pollinators and natural enemies in Michigan farm landscapes and beyond. **Logan Rowe** (roweloga@msu.edu), Dan Gibson, Rufus Isaacs and Douglas A. Landis, Michigan State Univ., East Lansing, MI

10:30 **Break**

10:45 **1029** Pollinator habitat for enhancing biological control and pollination services. **Gina Angelella** (ginama@vt.edu)[1], Megan E. O'Rourke[2] and Christopher McCullough[2], [1]Virginia Polytechnic Institute and State Univ., Painter, VA, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

11:00 **1030** Effects of landscape and local farm complexity on pollination and natural pest control services. **Amber Sciligo** (amber.sciligo@berkeley.edu)[1], Natalie Solares[1], David Gonthier[1], Adrian Lu[1], Daniel Karp[2] and Claire Kremen[1], [1]Univ. of California, Berkeley, CA, [2]Univ. of California, Davis, CA

11:15 **1031** Managing farms and landscapes for both biological control and pollination services. **Heather Grab** (hlc66@cornell.edu)[1], Katja Poveda[1], Bryan N. Danforth[1] and Gregory Loeb[2], [1]Cornell Univ., Ithaca, NY, [2]Cornell Univ., Geneva, NY

11:30 **1032** Managing local and landscape factors for the delivery of multiple agroecosystem services: Pollination and natural pest control in annual cropping systems. **Mario Balzan** (mario.balzan@mcast.edu.mt)[1], Gionata Bocci[2], Simone Marini[2] and Anna Camilla Moonen[2], [1]Malta College of Arts, Science and Technology, Paola, Malta, [2]Scuola Superiore Sant'Anna, Pisa, Italy

11:45 **1033** Flower power: Habitat management to support crop pollination and pest management. **Brett Blaauw** (bblaauw@uga.edu)[1], Rufus Isaacs[2] and Anne Nielsen[2], [1]Univ. of Georgia, Athens, GA, [2]Michigan State Univ., East Lansing, MI

12:00 **1034** Effects of land-use on pollinators and natural enemies and associated ecosystem services: Insights from field experiments and a meta-analysis. **David Crowder** (dcrowder@wsu.edu), Washington State Univ., Pullman, WA

12:15 **1035** Synergies between ecosystem services delivered by pollinators and pests' natural enemies. **Steve D. Wratten** (steve.wratten@lincoln.ac.nz)[1], Harpinder Sandhu[2] and Rowan Sprague[1], [1]Lincoln Univ., Lincoln, New Zealand, [2]Flinders Univ., Adelaide, Australia

SysEB Section Symposium: It Takes Two: Co-Evolutionary Innovation in Insect-Based Mutualisms

Meeting Room 502 (Convention Center)

Moderators and Organizers: Justin Van Goor and Finn Piatscheck, Iowa State Univ., Ames, IA

9:00 **1036** The evolution of obligate endosymbiosis across the insects. **Lee Henry** (l.henry@qmul.ac.uk)[1], Anouk van 't Padje[2], Toby Kiers[2], Jacintha Ellers[2] and Charlie Cornwallis[3], [1]Queen Mary Univ., London, United Kingdom, [2]Vrije Univ., Amsterdam, Netherlands, [3]Lund Univ., Lund, Sweden

9:30 **1037** Do environmentally-acquired *Burkholderia* symbionts serve as a reservoir of local adaptations for their insect hosts? **Alison Ravenscraft** (araven@email.arizona.edu) and Martha Hunter, Univ. of Arizona, Tucson, AZ

9:45 **1038** The enemy of my enemey is my friend: Nematode infection of non-pollinating fig wasp antagonists and the consequences for the fig-fig wasp pollination mutualism. **Justin Van Goor** (jvangoor@iastate.edu), Derek Houston and John D. Nason, Iowa State Univ., Ames, IA

10:00 **1039** The genetic basis of variation in aphid-*Buchnera* nutritional interactions. **Frances Blow** (fb285@cornell.edu), Seung Ho Chung and Angela E. Douglas, Cornell Univ., Ithaca, NY

10:15 **1040** Flowering variation and its effects on antagonists in a desert mutualism. **Finn Piatscheck** (finnp@iastate.edu) and John D. Nason, Iowa State Univ., Ames, IA

10:30 **1041** Elucidating the roles of insect host and bacterial symbiont on the metabolism of *Steinernema carpocapsae* (Nematoda: Steinernematidae) infective juveniles. **Brittany Peterson** (bfpeterson@email.arizona.edu)[1], John McMullen[2], Megan Yousefelahi[1] and S. Patricia Stock[1], [1]Univ. of Arizona, Tucson, AZ, [2]Cornell Univ., Ithaca, NY

10:45 **1042** A tale of two tentacles: Coevolution in the yucca-yucca moth mutualism. **Kari Segraves** (ksegrave@syr.edu) and David Althoff, Syracuse Univ., Syracuse, NY

Member Symposium: Acari Come Full Circle: From Omics to Physiology and Pathogen Transmission Biology

Meeting Room 605 (Convention Center)

Moderators and Organizers: Albert Mulenga and Patricia Pietrantonio, Texas A&M Univ., College Station, TX

9:00 **Welcoming Remarks**

9:02 **Introductory Remarks**

9:05 **1043** Comparative tick saliva proteomics reveals cross-tick species conserved tick saliva mechanisms. **Albert Mulenga** (amulenga@cvm.tamu.edu), Texas A&M Univ., College Station, TX

9:20 **1044** Tick determinants of Powassan virus transmission. Meghan Hermance[1], Rodrigo Santos[2], **Saravanan Thangamani** (sathanga@utmb.edu)[2] and Erin Reynolds[1], [1]Univ. of Texas Medical Branch, Galveston, TX, [2]Univ. of Texas, Galveston, TX

9:35 **1045** The tick endosymbiont *Candidatus* Midichloria mitochondrii and selenoproteins are essential for the growth of *Rickettsia parkeri* in the tick vector, *Amblyomma maculatum*. **Shahid Karim** (shahid.karim@usm.edu)[1], Khemraj Budachetri[1], Deepak Kumar[1], Gary Crispell[1], Christine Beck[2] and Gregory Dasch[3], [1]The Univ. of Southern Mississippi, Hattiesburg, MS, [2]Delta State Univ., Cleveland, MS, [3]Centers for Disease Control and Prevention, Atlanta, GA

9:50 **1046** Validating a putative immunome in *Amblyomma americanum*. **Lindsay Porter** (porterl@nsula.edu), Northwestern State Univ., Natchitoches, LA

10:05 **1047** Differential protein regulation during *Babesia* development in the mammalian host and tick vectors. **Massaro Ueti** (massaro@vetmed.wsu.edu), USDA - ARS, Pullman, WA

10:20 **1048** Tick neuropeptide receptors as potential targets for tick control. **Patricia Pietrantonio** (p-pietrantonio@tamu.edu), Texas A&M Univ., College Station, TX

10:35 **Break**

10:45 **1049** Metabolic function in the microbiome of the Tetranychoidea mites. **Jose Carlos Rodrigues V.** (jose_carlos@mac.com), Oscar Ospina and Steven Massey, Univ. of Puerto Rico, San Juan, PR

11:00 **1050** Molecular physiology of water absorption through the salivary glands of blacklegged ticks, *Ixodes scapularis*. Donghun Kim, Paulina Ruiz, Ludek Zurek and **Yoonseong Park** (ypark@ksu.edu), Kansas State Univ., Manhattan, KS

11:15 **1051** Impact of climate change on spider mites. **Maria Navajas** (maria.navajas@inra.fr), Institut National de la Recherche Agronomique, Montferrier Sur Lez, France

11:30 **1052** Tick host range adaptation. **Lucas Tirloni** (ltirloni@gmail.com), Texas A&M Univ., College Station, TX

11:45 **1053** Anti-inflammatory proteins in tick saliva. **Tae Kim** (taekim009@gmail.com), Texas A&M Univ., College Station, TX

12:00 **SP1054** *Ixodes scapularis* abundance in northern Wisconsin is influenced by overstory basal area and earthworms. **Scott Larson** (srlarson3@wisc.edu), Autumn Sabo, Eric Kruger and Susan Paskewitz, Univ. of Wisconsin, Madison, WI

12:10 **Concluding Remarks**

Member Symposium: Arctic, Antarctic, and Alpine Invertebrates: Research from Earth's Coldest and Most Rapidly Changing Environments

Meeting Room 401 (Convention Center)

Moderators and Organizers: Lauren Culler[1], Claudio Gratton[2] and Toke Høye[3], [1]Dartmouth College, Hanover, NH, [2]Univ. of Wisconsin, Madison, WI, [3]Aarhus Univ., Rønde, Denmark

9:00 **Introductory Remarks**

9:05 **1055** Soil invertebrate biodiversity response to climate change in the Antarctic Dry Valleys. Diana Wall and **Walter Andriuzzi** (walter.andriuzzi@colostate.edu), Colorado State Univ., Fort Collins, CO

9:20 **1056** Aquatic insects in extreme environments: Sentinels of climate change in the sub-Antarctic Magellanic ecoregion and maritime Antarctica. **James Kennedy** (james.kennedy@unt.edu)[1,2,3,4], Tamara Contador[2,4,5,6], Javier Rendoll[2,4,6], Melisa Gañán[2,4] and Ricardo Rozzi[1,2,4,5,6], [1]Univ. of North Texas, Denton, TX, [2]Univ. de Magallanes, Punta Arenas, Chile, [3]Sub-Antarctic Biocultural Conservation Program, Denton, TX, [4]Parque Etnobotánico Omora, Puerto Williams, Chile, [5]Instituto de Ecología y Biodiversidad, Santiago, Chile, [6]Sub-Antarctic Biocultural Conservation Program, Punta Arenas, Chile

9:35 **1057** Elevational range shifts in alpine aquatic invertebrates and consequences for ecosystem function. **Scott Wissinger** (swissing@allegheny.edu)[1,2], Jared Balik[2,3], Brad Taylor[2,3], Hamish S. Greig[2,4], Amanda DelVecchia[2,3] and Isaac Shepard[2,4], [1]Allegheny College, Meadville, PA, [2]Rocky Mountain Biological Laboratory, Crested Butte, CO, [3]North Carolina State Univ., Raleigh, NC, [4]Univ. of Maine, Orono, ME

9:50 **1058** Do thermal niches evolve in alpine insects? **Sean Schoville** (sean.schoville@wisc.edu) and Rachel Slatyer, Univ. of Wisconsin, Madison, WI

10:05 **1059** Wing length in Alaskan butterflies decreases during warmer summers across a broad geographic range. **Kathryn Daly** (kmdaly@alaska.edu), Derek Sikes, Daniel Mann and Greg Breed, Univ. of Alaska, Fairbanks, AK

10:20 **Break**

10:35 **1060** Declining diversity and abundance of high Arctic fly assemblages over two decades of rapid climate warming. **Toke Høye** (tth@bios.au.dk)[1], Sarah Loboda[2], Jade Savage[3], Niels Schmidt[4] and Christopher Buddle[2], [1]Aarhus Univ., Rønde, Denmark, [2]McGill Univ., Sainte-Anne-de-Bellevue, QC, Canada, [3]Bishop's Univ., Sherbrooke, QC, Canada, [4]Aarhus Univ., Roskilde, Denmark

10:50 **1061** Aquatic-terrestrial food webs vary among Arctic lakes with and without benthic colony-forming cyanobacteria. **Lauren Culler** (leculler@gmail.com), Jessica Trout-Haney, Alex Stendahl, Angie Spickard and Ross Virginia, Dartmouth College, Hanover, NH

11:05 **1062** Tundra wildfire alters the structure and function of microbial-invertebrate food webs. **Amanda Koltz** (amanda.koltz@gmail.com)[1], Ashley Asmus[2], Yamina Pressler[3], Gus Shaver[4], Laura Gough[5] and John Moore[3], [1]Washington Univ., St. Louis, MO, [2]Univ. of Texas, Arlington, TX, [3]Colorado State Univ., Fort Collins, CO, [4]Marine Biological Laboratory, Woods Hole, MA, [5]Towson Univ., Towson, MD

11:20 **1063** Trophic redundancy leads to a neutral effect of warming on energy flux through an invertebrate food web. **Daniel Nelson** (daniel.nelson@ou.edu)[1], Jonathan Benstead[2], Alex Huryn[2], Wyatt Cross[3], James Hood[4], Philip Johnson[2], James Junker[3], Gísli Gíslason[5] and Jón Ólafsson[6], [1]Univ. of Oklahoma, Norman, OK, [2]Univ. of Alabama, Tuscaloosa, AL, [3]Montana State Univ., Bozeman, MT, [4]The Ohio State Univ., Columbus, OH, [5]Univ. of Iceland, Reykjavik, Iceland, [6]Institute of Freshwater Fisheries, Reykjavik, Iceland

11:35 **1064** Snow geese nipping at phenological diversity of tundra mosquitoes. **John Park** (johnspark@uchicago.edu), Univ. of Chicago, Chicago, IL

11:50 **Discussion**

Member Symposium: Communication at the Intersection of Urban and Forest Communities

Meeting Room 708 (Convention Center)

Moderators and Organizers: Jessica Hartshorn[1] and David Coyle[2], [1]Minnesota Dept. of Natural Resources, Grand Rapids, MN, [2]Univ. of Georgia, Athens, GA

9:00 **Welcoming Remarks**

9:09 **1065** Untapped resources: The overlooked biodiversity of urban forests. **Derek Hennen** (derhennen@gmail.com), Virginia Polytechnic Institute and State Univ., Blacksburg, VA

9:24 **Discussion 1**

9:36 **1066** Growing urban forestry awareness, outreach, and education in Kentucky's bluegrass region through the Urban Forest Initiative. **Lynne Rieske-Kinney** (lrieske@uky.edu), Univ. of Kentucky, Lexington, KY

9:51 **Discussion 2**

10:03 **1067** Tickborne diseases in your backyard: What's lurking around schools, parks, and other public places. **Ashley P. G. Dowling** (adowling@uark.edu) and Krista Pike, Univ. of Arkansas, Fayetteville, AR

10:18 **Discussion 3**

10:30 **1068** Burning with enthusiasm: How we mix fun and science to educate citizens about invasive species and firewood. **Leigh Greenwood** (lgreenwood@tnc.org), The Nature Conservancy, Missoula, MT

10:45 **Discussion 4**

10:57 **Break**

11:12 **1069** Sympathy for the devil: Helping master gardeners understand pest control. **Jonathan Larson** (jonathan.larson@unl.edu), Univ. of Nebraska, Omaha, NE

11:27 **Discussion 5**

11:39 **1070** Backyard bark beetles: Citizen science at home. **Paige Carlson** (pcarlson7@ufl.edu) and Jiri Hulcr, Univ. of Florida, Gainesville, FL

11:54 **Discussion 6**

12:06 **1071** Bridging the gap between university research and land managers. **Jessica Hartshorn** (jessica.hartshorn@state.mn.us), Minnesota Dept. of Natural Resources, Grand Rapids, MN

12:21 **Discussion 7**

12:33 **1072** You're expected to know it all: Challenges of a regional forest health extension program. **David Coyle** (dcoyle@sref.info), Univ. of Georgia, Athens, GA

12:48 **Discussion 8**

Member Symposium: Genomics of Adaptation: Linking the Next Generation of Genome-Wide Analysis to Understand and Manage Complex Traits

Meeting Room 302/303 (Convention Center)

Moderators and Organizers: Gregory Ragland[1], Glen Hood[2], Scott Egan[2], Daniel Hahn[3] and Meredith Doellman[4], [1]Univ. of Colorado, Denver, CO, [2]Rice Univ., Houston, TX, [3]Univ. of Florida, Gainesville, FL, [4]Univ. of Notre Dame, Notre Dame, IN

9:00 **1073** Introduction to the symposium "Genomics of adaptation: Linking the next generation of genome-wide analysis to understand and manage complex traits". **Gregory Ragland** (gregory.ragland@ucdenver.edu)[1], Glen Hood[2], Scott Egan[2], Meredith Doellman[3] and Daniel Hahn[4], [1]Univ. of Colorado, Denver, CO, [2]Rice Univ., Houston, TX, [3]Univ. of Notre Dame, Notre Dame, IN, [4]Univ. of Florida, Gainesville, FL

9:15 **1074** Experimental evidence for the contribution of plant genetic variation to interaction outcome between the Melissa blue butterfly (*Lycaeides melissa*) and an exotic host plant (alfalfa). **Zachariah Gompert** (zach.gompert@usu.edu)[1], Lauren Lucas[1] and Matthew L. Forister[2], [1]Utah State Univ., Logan, UT, [2]Univ. of Nevada, Reno, NV

9:30 **1075** Landscape genomics of Colorado potato beetle provides evidence of polygenic adaptation to insecticides. **Michael S. Crossley** (mcrossley3@gmail.com)[1], Yolanda Chen[2], Russell Groves[1] and Sean Schoville[1], [1]Univ. of Wisconsin, Madison, WI, [2]Univ. of Vermont, Burlington, VT

9:45 **1076** From mutations to species: Causes and consequences of host-use variation in pine sawflies. **Catherine Linnen** (catherine.linnen@uky.edu), Univ. of Kentucky, Lexington, KY

10:00 **1077** From host race to species: Genome-wide divergence parallels ecological variation within and across species in the *Rhagoletis pomonella* complex (Diptera: Tephritidae). **Meredith Doellman** (mdoellma@nd.edu)[1], Thomas Powell[2], Katherine Inskeep[1], Scott Egan[3], Gregory Ragland[4], Peter Meyers[1], Glen Hood[3], James Smith[5], Stewart Berlocher[6] and Jeffrey Feder[1], [1]Univ. of Notre Dame, Notre Dame, IN, [2]State Univ. of New York, Binghamton, NY, [3]Rice Univ., Houston, TX, [4]Univ. of Colorado, Denver, CO, [5]Michigan State Univ., East Lansing, MI, [6]Univ. of Illinois, Champaign, IL

10:15 **1078** Genomes of *Tetranychus urticae* strains reveal multiple selective sweeps in a global population sample. **Richard Clark** (clark@biology.utah.edu)[1], Andre Kurlovs[1], Robert Greenhalgh[1], Huyen Bui[1], Olivia Kosterlitz[1], Wannes Dermauw[2], Astrid Bryon[2], Sabina Bajda[2] and Thomas Van Leeuwen[2], [1]Univ. of Utah, Salt Lake City, UT, [2]Ghent Univ., Ghent, Belgium

10:30 **1079** Revealing gene function in regions of recent genomic divergence underlying insect-host plant adaptation. **William Etges** (wetges@uark.edu), Univ. of Arkansas, Fayetteville, AR

10:45 **Break**

11:00 **1080** Cynipid galler induces massive gene expression changes in oak gall. **Ellen Martinson** (e.martinson@rochester.edu)[1], Jack Werren[1] and Scott Egan[2], [1]Univ. of Rochester, Rochester, NY, [2]Rice Univ., Houston, TX

11:15 **1081** The genomics of behavioral adaptation to vector control in the malaria mosquito *Anopheles coluzzii*. Jacob Meyers[1], Hans J. Overgaard[2] and **Michel A. Slotman** (maslotman@ag.tamu.edu)[1], [1]Texas A&M Univ., College Station, TX, [2]Norwegian Univ. of Life Sciences, Ås, Norway

11:30 **1082** A genomic and genetic perspective on the evolution of humidity preferences in *Drosophila*. **Aaron Comeault** (aacomeault@gmail.com), Univ. of North Carolina, Chapel Hill, NC

11:45 **1083** Evolutionary genomics of adaptation and behavior in cactophilic *Drosophila*. **Luciano Matzkin** (lmatzkin@email.arizona.edu), Univ. of Arizona, Tucson, AZ

12:00 **1084** Experimental evidence natural selection affects genome-wide geographic and host-related differentiation during sympatric divergence in *Rhagoletis* fruit flies (Diptera: Tephritidae). **Jeffrey Feder** (jfeder@nd.edu)[1], Meredith Doellman[1], Glen Hood[2], Gregory Ragland[3], Scott Egan[2], Peter Meyers[1], Thomas Powell[4] and Daniel Hahn[5], [1]Univ. of Notre Dame, Notre Dame, IN, [2]Rice Univ., Houston, TX, [3]Univ. of Colorado, Denver, CO, [4]State Univ. of New York, Binghamton, NY, [5]Univ. of Florida, Gainesville, FL

12:15 **1085** Genomics of adaptation coupled with a shift to plant parasitism in the Drosophilidae. **Andrew Gloss** (andy.gloss@gmail.com)[1], Anna Nelson Dittrich[2], Richard Lapoint[2] and Noah Whiteman[3], [1]Univ. of Chicago, Chicago, IL, [2]Univ. of Arizona, Tucson, AZ, [3]Univ. of California, Berkeley, CA

12:30 **1086** Characterizing the genetic basis of mimicry in butterflies. **Marcus Kronforst** (mkronforst@uchicago.edu), Univ. of Chicago, Chicago, IL

Member Symposium: Innovative Advancements in Eradicating the Asian Longhorned Beetle

Meeting Room 703 (Convention Center)

Moderators and Organizers: Robyn Rose[1], Rhonda Santos[2] and R. Talbot Trotter[3], [1]USDA - APHIS, Riverdale, MD, [2]USDA - APHIS, Worcester, MA, [3]USDA - Forest Service, Hamden, CT

9:00 **1087** Biology, damage, economic and environmental importance of the Asian longhorned beetle (*Anoplophora glabripennis*). **Michael Bohne** (mbohne@fs.fed.us), USDA - Forest Service, Durham, NH

9:15 **1088** Asian longhorned beetle cooperative eradication program. **Robyn Rose** (robyn.i.rose@aphis.usda.gov), USDA - APHIS, Riverdale, MD

9:45 **1089** Post-establishment spread by the Asian longhorned beetle: Customizing risk management with local beetle behavior. **R. Talbot Trotter** (rttrotter@fs.fed.us), USDA - Forest Service, Hamden, CT

10:00 **1090** Genetic relationships between Asian longhorned beetle specimens collected before and after 2008 in U.S. and Canada. **Yunke Wu** (yunke.wu@aphis.usda.gov), USDA - APHIS, Buzzards Bay, MA

10:15 **1091** Male and female attractants for *Anoplophora glabripennis*. **Damon Crook** (damon.j.crook@aphis.usda.gov), USDA - APHIS, Buzzards Bay, MA

10:30 **Break**

10:45 **1092** Advancements and new technologies in surveying for Asian longhorned beetle. **Greg Parra** (greg.r.parra@aphis.usda.gov), USDA - APHIS, Raleigh, NC

11:00 **1093** Evolution in chemical treatment methods for Asian longhorned beetle: From the cities to the forests. **Phillip A. Lewis** (phillip.a.lewis@aphis.usda.gov), USDA - APHIS, Buzzards Bay, MA

11:15 **1094** Progress towards biocontrol of the Asian longhorned beetle. **Juli Gould** (juli.r.gould@aphis.usda.gov)[1], Xiao-yi Wang[2] and Breanne Aflague[3], [1]USDA - APHIS, Buzzards Bay, MA, [2]Chinese Academy of Forestry, Beijing, China, [3]Univ. of New Hampshire, Durham, NH

11:30 **1095** The current status of non-chemical regulatory treatments for Asian longhorned beetle lifestages in wood. **Sarah Shugrue** (sarah.e.shugrue@aphis.usda.gov), Phillip A. Lewis and Ron Mack, USDA - APHIS, Buzzards Bay, MA

11:45 **1096** How outreach and education for Asian longhorned beetle ignites the public. **Rhonda Santos** (rhonda.j.santos@aphis.usda.gov), USDA - APHIS, Worcester, MA

Member Symposium: Insect Nanocoatings: Diversity, Mechanisms, and Functions

Meeting Room 711 (Convention Center)

Moderator and Organizer: Vladimir Katanaev, Univ. of Lausanne, Lausanne, Switzerland

9:00 **Introductory Remarks**

9:05 **1097** Crystallographic analysis of periodic structures on butterfly eyes. **Uwe Erb** (uwe.erb@utoronto.ca), Jason Tam and Ken Lee, Univ. of Toronto, Toronto, ON, Canada

9:35 **1098** Presentation withdrawn

9:50 **1099** Structural diversity, function, and molecular mechanisms of insect corneal nanocoatings. **Vladimir Katanaev** (vladimir.katanaev@unil.ch)[1,2], Mikhail Kryuchkov[1] and Artem Blagodatski[2], [1]Univ. of Lausanne, Lausanne, Switzerland, [2]Far Eastern Federal Univ., Vladivostok, Russian Federation

10:05 **Break**

10:20 **1100** Presentation withdrawn

10:35 **1101** Biomimetic insect inspired nanostructured surfaces: Functionality, fabrication, and potential application. **Dennis LaJeunesse** (drlajeun@uncg.edu), Univ. of North Carolina, Greensboro, NC

10:50 **Roundtable Discussion**

Member Symposium: Pulse Crop Insect Pests and Their Management

Meeting Room 701 (Convention Center)

Moderator and Organizer: Gadi V. P. Reddy, Montana State Univ., Conrad, MT

9:00 **1102** Towards a comprehensive decision support system and management package of pulse crop pests – The pea leaf weevil case study. **Héctor Cárcamo** (hector.carcamo@agr.gc.ca)[1], Scott Meers[2], Maya Evenden[3], Asha Wijerathna[3], Owen Olfert[4] and Meghan Vankosky[5], [1]Agriculture and Agri-Food Canada, Lethbridge, AB, Canada, [2]Alberta Agriculture and Rural Development, Brooks, AB, Canada, [3]Univ. of Alberta, Edmonton, AB, Canada, [4]Agriculture and Agri-Food Canada, Saskatoon, SK, Canada, [5]Univ. of California, Riverside, CA

9:30 **1103** Insect pests of pulse crops in North Dakota. **Janet Knodel** (janet.knodel@ndsu.edu)[1], Patrick Beauzay[1], Audrey Kalil[2] and Julie Pasche[1], [1]North Dakota State Univ., Fargo, ND, [2]North Dakota State Univ., Williston, ND

9:45 **1104** Insect-transmitted viruses in pulse crops. **Sanford Eigenbrode** (sanforde@uidaho.edu), Jake Hennessey and Ying Wu, Univ. of Idaho, Moscow, ID

10:00 **1105** Semiochemical-based trapping of pea leaf weevil in the Canadian Prairie Provinces. **Maya Evenden** (mevenden@ualberta.ca)[1], Amanda St. Onge[1], Dylan Sjolie[1] and Héctor Cárcamo[2], [1]Univ. of Alberta, Edmonton, AB, Canada, [2]Agriculture and Agri-Food Canada, Lethbridge, AB, Canada

10:15 **1106** Role of biopesticides in pea leaf weevil management. **Govinda Shrestha** (govinda.shrestha@montana.edu), Debra Miller and Gadi V. P. Reddy, Montana State Univ., Conrad, MT

10:30 **1107** Pea weevil: A new pest in Montana. **Gadi V. P. Reddy** (reddy@montana.edu), Ramadevi Gadi, Govinda Shrestha and Debra Miller, Montana State Univ., Conrad, MT

10:45 **1108** Buffering pulse cropping systems against outbreaks of *Sitona* weevils. **Heikki Hokkanen** (heikki.hokkanen@helsinki.fi) and Ingeborg Menzler-Hokkanen, Univ. of Helsinki, Helsinki, Finland

11:00 **1109** Integrated pest management in pulse crops: How far have we come and what is still needed. **John Gavloski** (john.gavloski@gov.mb.ca), Manitoba Agriculture, Carman, MB, Canada

11:15 **1110** Microbial agents in pulse crops – Do they have a role? Where? How? **Stefan T. Jaronski** (stefan.jaronski@ars.usda.gov), USDA - ARS, Sidney, MT

11:30 **1111** USADPLC - Importance of pulse crops and management tools and resources. **Jeff Rumney** (jrumney@usapulses.org), USA Dry Pea and Lentil Council, Moscow, ID

Member Symposium: The Inspiring, Exploding Skeptical Movement and its Impact on Entomology

Meeting Room 405 (Convention Center)

Moderator and Organizer: Robert K. D. Peterson, Montana State Univ., Bozeman, MT

9:00 **Introductory Remarks**

9:05 **1112** All the news that's not fit to print: Science vs. science journalism. **Robert K. D. Peterson** (bpeterson@montana.edu), Montana State Univ., Bozeman, MT

9:20 **1113** Are *ad hominem* arguments about funding sources consistent with skeptical inquiry? **Allan Felsot** (afelsot@wsu.edu), Washington State Univ., Richland, WA

9:35 **1114** Why butterflies aren't elephants, hitmen aren't applied ecologists, and scientists too often lie: The need for skepticism within science. **Leon G. Higley** (lhigley@drshigley.com), Univ. of Nebraska, Lincoln, NE

9:50 **1115** GMO or OMG? Embracing the skeptical movement to help entomology. **Anthony M. Shelton** (ams5@cornell.edu), Cornell Univ., Geneva, NY

10:05 **1116** Can entomologists resuscitate the Age of Reason? **Jeffrey Bradshaw** (jbradshaw2@unl.edu), Univ. of Nebraska, Scottsbluff, NE

10:20 **1117** (Un)teaching pseudoscience. **Marianne Alleyne** (vanlaarh@life.illinois.edu), Univ. of Illinois, Champaign, IL

10:35 **1118** Why you should be skeptical of the skeptics: The common mistakes science communicators make and how to avoid them. **Timothy O'Shea** (tim@sciencecolorado.com), Coloradans for Scientific Inquiry, Denver, CO

10:50 **Panel Discussion**

Member Symposium: Toys of the Behavioral and Biocontrol Trade: The Possibilities and What You Need to Start

Meeting Room 501 (Convention Center)

Moderator and Organizer: Jana Lee, USDA - ARS, Corvallis, OR

9:00 **Welcoming Remarks**

9:05 **1119** Keynote: Super mark it! Using protein tagging to track insect movement and predator feeding activity. **James Hagler** (james.hagler@ars.usda.gov), USDA - ARS, Maricopa, AZ

9:35 **1120** Computer vision to enhance behavioral research on insects. **Nicholas Manoukis** (nicholas.manoukis@ars.usda.gov), USDA - ARS, Hilo, HI

9:50 **1121** Assessing insect flight behavior in the laboratory. **Steven Naranjo** (steve.naranjo@ars.usda.gov), USDA - ARS, Maricopa, AZ

10:05 **1122** Using Arduino and household circuitry to assist your research and build cool and useful gadgets. **Noel Hahn** (nghahn@gmail.com), Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

SD1123 Optimal EPG settings to avoid aberrations in feeding behavior of *Bagrada hilaris:* AC-DC monitor as a new alternative for Heteropterans. **Edmar Tuelher** (edmar.tuelher@ufv.br)[1], Tiago Lucini[2], Felix Cervantes[3] and Elaine Backus[3], [1]Univ. Federal de Viçosa, Viçosa, Brazil, [2]Federal Univ. of Parana, Curitiba, Brazil, [3]USDA - ARS, Parlier, CA

SD1124 Flight mill miniaturized – For spotted wing drosophila. Jessica Wong[1], **J. Megan Woltz** (megan.woltz@gmail.com)[1,2], Danielle Lightle[3] and Jana Lee[4], [1]Oregon State Univ., Corvallis, OR, [2]Lindenwood Univ., St. Charles, MO, [3]Univ. of California, Orland, CA, [4]USDA - ARS, Corvallis, OR

10:20 **Poster Session/Break**

10:40 **1125** AC-DC electropenetrography (EPG) for in-depth studies of oviposition and piercing-sucking feeding behaviors. **Elaine Backus** (elaine.backus@ars.usda.gov)[1], Felix Cervantes[1] and Raul Narciso Guedes[2], [1]USDA - ARS, Parlier, CA, [2]Univ. Federal de Viçosa, Viçosa, Brazil

10:55 **1126** Proteins in arthropod food webs: Tools for detecting predation and quantifying nutrients. **Dalila Rendon** (dalila.rendon@oregonstate.edu), Oregon State Univ., Corvallis, OR

11:10 **1127** Advancing the detection of predation through integration of molecular ecology and mathematical models. **James Harwood** (jamesdh@qau.edu.cn), Qingdao Agricultural Univ., Shandong, China

11:25 **1128** Sweet assays – Simple way to study feeding ecology and behavioral physiology. **Jana Lee** (jana.lee@ars.usda.gov), USDA - ARS, Corvallis, OR

10-min: MUVE, Ticks

Meeting Room 503 (Convention Center)

Moderators: Emily Bencosme-Cuevas[1], Eric J. Dotseth[2] and Muhammad Oneeb[3], [1]Northwestern State Univ., Natchitoches, LA, [2]West Virginia Dept. of Health and Human Resources, Charleston, WV, [3]Univ. of Veterinary and Animal Sciences, Lahore, Pakistan

9:00 **1129** Functional validation of in silico-identified putative infection-responsive genes in the lone star tick. **Emily Bencosme-Cuevas** (ebencosme070031@nsula.edu) and Lindsay Porter, Northwestern State Univ., Natchitoches, LA

9:10 **1130** Ehrlichial and rickettsial pathogens in lone star ticks at FL state parks and wildlife management areas. Jeffrey C. Hertz[1], **Phillip Kaufman** (pkaufman@ufl.edu)[1], Cynthia C. Lord[2] and Sandra A. Allan[3], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Florida, Vero Beach, FL, [3]USDA - ARS, Gainesville, FL

9:20 **1131** Detection of Bourbon virus (Orthomyxoviridae: *Thogotovirus*) in field collected ticks. **Harry Michael Savage** (hms1@cdc.gov), Centers for Disease Control and Prevention, Fort Collins, CO

9:30 **1132** First report acaricide resistant mutations in *Rhipicephalus microplus* collected from Nilgai antelope in Cameron County, Texas. **Guilherme Klafke** (gmklafke@gmail.com)[1], Jason Tidwell[1], Pia Olafson[2], Robert John Miller[1] and Adalberto A. Pérez de León[2], [1]USDA - ARS, Edinburg, TX, [2]USDA - ARS, Kerrville, TX

9:40 **1133** The validation of an ecological model measuring the questing activity of *Rhipicephalus* (*Boophilus*) *microplus*, the southern Cattle Fever Tick. **Brenda Leal** (brenda.leal01@utrgv.edu), Univ. of Texas, Edinburg, TX

9:50 **1134** Distribution of ticks (Acari: Ixodidae) infesting ruminants of rural housing system from District Chakwal, Pakistan. **Muhammad Oneeb** (muhammad.oneeb@uvas.edu.pk)[1], Asma Bilal[1], Adalberto A. Pérez de León[2], Huma Naeem[1] and Muhammad Nazir[3], [1]Univ. of Veterinary and Animal Sciences, Lahore, Pakistan, [2]USDA - ARS, Kerrville, TX, [3]Bahauddin Zakariya Univ., Multan, Pakistan

10:00 **1135** Strains of *Borrelia burgdorferi* identified in *Ixodes scapularis* nymphs collected during active and passive surveillance in Monmouth County, NJ. **Andrea Egizi** (andrea.egizi@co.monmouth.nj.us) and Robert Jordan, Monmouth County Mosquito Control Division, Tinton Falls, NJ

10:10 **1136** Geographic information system applications in tick and tick-borne disease surveillance. **Eric J. Dotseth** (eric.j.dotseth@wv.gov)[1], Miguella Mark-Carew[1] and Brian Hendricks[2], [1]West Virginia Dept. of Health and Human Resources, Charleston, WV, [2]West Virginia Univ., Morgantown, WV

10:20 **1137** An old-fashioned approach: Using observation to identify unusual behaviors. **Joyce Sakamoto** (jms1198@psu.edu)[1], Hitoshi Tsujimoto[2], Anjel Helms[1], Eric Yip[1], John Tooker[1] and Jared Ali[1], [1]Pennsylvania State Univ., University Park, PA, [2]Postdoctoral Research Associate, College Station, TX

10:30 **1138** The tick biocontrol agent *Metarhizium brunneum* (= *M. anisopliae*) (strain F52) does not reduce the abundance of non-target arthropods in a suburban landscape. **Ilya R. Fischhoff** (fischhoffi@caryinstitute.org)[1], Felicia Keesing[2] and Richard Ostfeld[1], [1]Cary Institute of Ecosystem Studies, Millbrook, NY, [2]Bard College, Annandale, NY

10-min: MUVE, Urban Pests

Meeting Room 607 (Convention Center)

Moderators: Amanda Eiden[1], Elida Espinoza[2] and Karen M. Vail[3], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Texas A&M Univ., College Station, TX, [3]Univ. of Tennessee, Knoxville, TN

9:00 **1139** Effect of German cockroach (*Blattella germanica*) and bed bug (*Cimex lectularius)* integrated pest management in a low-income housing community. **Amanda Eiden** (amanda.eiden@rutgers.edu)[1], Changlu Wang[1], Chen Zha[1] and Richard Cooper[2], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Cooper Pest Solutions, Lawerenceville, NJ

9:10 **1140** Insecticide resistance evolution in field-selected German cockroaches (*Blattella germanica* (L.)) exposed to different insecticide deployment strategies. **Mahsa Fardisi** (mfardisi@purdue.edu), Ameya Gondhalekar and Michael Scharf, Purdue Univ., West Lafayette, IN

9:20 **1141** Baiting for German cockroaches: Effects of bait placement on population and allergen levels. **Zachary DeVries** (zcdevrie@ncsu.edu), Richard Santangelo, Emily Vernon and Coby Schal, North Carolina State Univ., Raleigh, NC

9:30 **1142** Targeting commensal bacteria to increase insecticide efficacy against resistant strains of the German cockroach (Blattodea: Blatellidae). **Jose Pietri** (jose@apexbait.com) and Dangsheng Liang, Apex Bait Technologies, Inc, Santa Clara, CA

9:40 **1143** Pest exclusion using physical barriers: A sustainable future for new and existing structures. **Cassie Krejci** (ckrejci@polyguard.com)[1] and Roger Gold[2], [1]Polyguard, Ennis, TX, [2]Texas A&M Univ., College Station, TX

9:50 **1144** Building-wide quick inspections find unreported bed bug infestations. **Karen M. Vail** (kvail@utk.edu) and Jennifer G. Chandler, Univ. of Tennessee, Knoxville, TN

10:00 **Break**

10:10 **1145** Ohio bed bug survey. **Susan C. Jones** (Jones.1800@osu.edu), The Ohio State Univ., Columbus, OH

10:20 **1146** Impoverished genetic diversity and colony breeding structure in introduced populations of the invasive ant *Brachyponera chinensis*. **Pierre-Andre Eyer** (pieyer@live.fr)[1], Kenji Matsuura[2], Kazuki Tsuji[3] and Edward Vargo[1], [1]Texas A&M Univ., College Station, TX, [2]Kyoto Univ., Kyoto, Japan, [3]Univ. of the Ryukyus, Nishihara, Japan

10:30 **1147** Supercolonial structure in the invasive population of the tawny crazy ant *Nylanderia fulva*. **Edward Vargo** (ed.vargo@tamu.edu)[1], Bryant McDowell[1], Pierre-Andre Eyer[1], Laura Johnson[1], Luis Calcaterra[2], DeWayne Shoemaker[3] and Robert Puckett[1], [1]Texas A&M Univ., College Station, TX, [2]Fundación para el Estudio de Especies Invasivas, Hurlingham, Argentina, [3]Univ. of Tennessee, Knoxville, TN

10:40 **1148** Tawny crazy ant (*Nylanderia fulva* Mayr) management research at Texas A&M University (Rollins Urban and Structural Entomology Facility). **Robert Puckett** (rpuck@tamu.edu) and Edward Vargo, Texas A&M Univ., College Station, TX

10:50 **1149** Bacterial community diversity of *Solenopsis invicta* Buren according to colony, ecoregion, and functional category. **Elida Espinoza** (ellyspnz@gmail.com)[1], Tawni L. Crippen[2], Aaron Tarone[1], Jeffery K. Tomberlin[1] and Roger Gold[1], [1]Texas A&M Univ., College Station, TX, [2]USDA - ARS, College Station, TX

10-min: MUVE, Veterinary Pests

Meeting Room 504 (Convention Center)

Moderators: Denise Bonilla[1], Jennifer Pechal[2] and Jerome A. Hogsette[3], [1]USDA - APHIS, Fort Collins, CO, [2]Michigan State Univ., East Lansing, MI, [3]USDA - ARS, Gainesville, FL

9:00 **1150** Responding to the screwworm outbreak on the Florida Keys. **Steve Skoda** (steve.skoda@ars.usda.gov)[1], J. Welch[2] and P. Phillips[1], [1]USDA - ARS, Kerrville, TX, [2]USDA - APHIS, College Station, TX

9:10 **1151** Rotten liver! New World screwworm field surveillance and identification. **Denise Bonilla** (denise.l.bonilla@aphis.usda.gov), USDA - APHIS, Fort Collins, CO

9:20 **1152** Functional genomics of the secondary screwworm *Cochliomyia macellaria* (Diptera: Calliphoridae). **Aaron Tarone** (tamlucilia@tamu.edu)[1], Jonathan Parrott[1], Satyam Srivastav[1], Anne Andere[2], Sarah Lewis[2], Christine Picard[2] and Sing-Hoi Sze[1], [1]Texas A&M Univ., College Station, TX, [2]Indiana Univ.-Purdue Univ., Indianapolis, IN

9:30 **1153** Calliphoridae microbiome dynamics during decomposition. **Jennifer Pechal** (pechalje@msu.edu), Courtney Weatherbee and M. Eric Benbow, Michigan State Univ., East Lansing, MI

9:40 **1154** Carrion with delayed Diptera colonization: Implications in decomposition ecology and forensic entomology. **Chong Chin Heo** (chongchin83@tamu.edu)[1,2], Tawni L. Crippen[3], Jacqueline Aitkenhead-Peterson[1], Pete Teel[1], Aaron Tarone[1] and Jeffery Tomberlin[1], [1]Texas A&M Univ., College Station, TX, [2]Univ. Teknologi Mara, Sungai Buloh, Malaysia, [3]USDA - ARS, College Station, TX

9:50 **1155** Downstream effects of bluetongue virus exposure on *Culicoides sonorensis* offspring. **Emily McDermott** (emily.g.mcdermott.ctr@mail.mil)[1] and Bradley Mullens[2], [1]Walter Reed Army Institute of Research, Silver Spring, MD, [2]Univ. of California, Riverside, CA

10:00 **1156** Which midge is it? Suspicious *Culicoides* (Diptera: Ceratopogonidae) species of the southeastern United States. **Stacey Vigil** (svigil@uga.edu)[1], Joseph Corn[1] and Mark Ruder[2], [1]Univ. of Georgia, Athens, GA, [2]USDA - ARS, Manhattan, KS

10:10 **Break**

10:20 **1157** More stable flies (Diptera: Muscidae) were captured by protecting sticky stable fly traps with electric fence and placing them inside animal exhibit yards at the Smithsonian's National Zoological Park. **Jerome A. Hogsette** (jerry.hogsette@ars.usda.gov)[1] and Gregory Ose[2], [1]USDA - ARS, Gainesville, FL, [2]Smithsonian National Zoological Park, Washington, DC

10:30 **1158** Presentation withdrawn

10:40 **1159** Field evaluation of horn fly control on beef herds. **Nancy C. Hinkle** (nhinkle@uga.edu)[1], Annie Rich[1], Raymond Fitzpatrick[2], Bob Waldorf[3], Greg Pittman[4], Trey Gafnea[5] and William Lovett[6], [1]Univ. of Georgia, Athens, GA, [2]Univ. of Georgia, Carnesville, GA, [3]Univ. of Georgia, Homer, GA, [4]Univ. of Georgia, Jefferson, GA, [5]Univ. of Georgia, Monticello, GA, [6]Univ. of Georgia, Alma, GA

10:50 **1160** Activity of an acetamiprid bait against certain filth flies in a livestock setting. **Dina Richman** (dina.richman@fmc.com), FMC Corporation, Philadelphia, PA

11:00 **1161** Factors affecting the excretion of GFP *Salmonella enterica* serovar typhimurium by adult house flies (Diptera: Muscidae; *Musca domestica* L.). **Dana Nayduch** (dana.nayduch@ars.usda.gov)[1], Klara Zurek[2], Jessica Thomson[2] and Kathleen Yeater[3], [1]USDA - ARS, Manhattan, KS, [2]Kansas State Univ., Manhattan, KS, [3]USDA - ARS, Fort Collins, CO

11:10 **1162** Using technology to assess ectoparasite effects on poultry behavior and welfare. **Amy C. Murillo** (alock001@ucr.edu)[1], Richard Blatchford[2] and Alec Gerry[1], [1]Univ. of California, Riverside, CA, [2]Univ. of California, Davis, CA

11:20 **1163** Prevalence of ecto-parasitic infestation in domestic poultry from southern Punjab, Pakistan. **Muhammad Mazhar Ayaz** (mazharayaz@bzu.edu.pk) and Muhammad Nazir, Bahauddin Zakariya Univ., Multan, Pakistan

10-min: PBT, General Physiology 1

Meeting Room 304 (Convention Center)

Moderator: Pierre Lesne, Texas A&M Univ., College Station, TX

9:00 **1164** Characterization of chemosensory proteins from the red imported fire ant, *Solenopsis invicta*: Construction of ligand binding profiles. **John Boswell** (jboswell@ufl.edu), Arun Wanchoo and Nemat Keyhani, Univ. of Florida, Gainesville, FL

9:10 **1165** Presentation withdrawn

9:20 **1166** Using RNAi to test odorant perception in the western tarnished plant bug, *Lygus hesperus*. **Colin Brent** (colin.brent@ars.usda.gov), Daniel Langhorst and Joe Hull, USDA - ARS, Maricopa, AZ

9:30 **1167** Elucidating the biosynthesis of terpene pheromones in stink bugs for the development of alternative pest management strategies. **Dorothea Tholl** (tholl@vt.edu)[1], Jason Lancaster[1], Bryan Lehner[1], Claus Tittiger[2], Sharon Young[2], Ashot Khrimian[3], Donald C. Weber[3], Michael Sparks[3], Dawn Gundersen-Rindal[3] and Thomas P. Kuhar[1], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Univ. of Nevada, Reno, NV, [3]USDA - ARS, Beltsville, MD

9:40 **1168** Tobacco-related compounds induce modification in the physiology and behaviour of the German cockroach, *Blattella germanica* L. **Vincenzo Di Ilio** (vincenzo.diilio@rothamsted.ac.uk), Michael Birkett and John Pickett, Rothamsted Research, Harpenden, United Kingdom

9:50 **1169** Behavioral plasticity as a driver of competition between the invasive ant species *Solenopsis invicta* and *Nylanderia fulva*. **Pierre Lesne** (pierre.lesne@tamu.edu) and Spencer Behmer, Texas A&M Univ., College Station, TX

10:00 **Break**

10:10 **1170** Strategy and mechanism for intercepting unpredictable moving targets in the blue-tailed damselfly, *Ischnura elegans*. **Ziv Kassner** (zivkassner@gmail.com) and Gal Ribak, Tel Aviv Univ., Tel Aviv, Israel

10:20 **1171** Profiles of putative magnetoreceptor (MagR) reveals a possible mode of magnetic response in rice planthoppers, *Nilaparvata lugens*. **Weidong Pan** (panwd@mail.iee.ac.cn)[1], Jingjing Xu[1], Yingchao Zhang[1], Yue Li[1], Guijun Wan[2], Fajun Chen[2] and Gregory Sword[3], [1]Chinese Academy of Sciences, Beijing, China, [2]Nanjing Agricultural Univ., Nanjing, China, [3]Texas A&M Univ., College Station, TX

10:30 **1172** Hot and cold flies, the circadian induction of eclosion and activity of flesh flies, *Sarcophaga crassipalpis,* by thermocycling. **Karl Joplin** (joplin@etsu.edu), Marilyn Permenter and Darrell Moore, East Tennessee State Univ., Johnson City, TN

10:40 **1173** Flight muscle properties repond to repeated weight lifting in the common eastern bumble bee (*Bombus impatiens*). **Chris Petranek** (chrispetranek@gmail.com), Univ. of Wyoming, Laramie, WY

10:50 **1174** Behavior and extra-oral digestion of wasp *Sclerodermus guani* (Hymenoptera: Bethylidae) to parasitize the borer *Monochamus alternatus* (Coleoptera: Cerambycidae) part I: Biting, subduing, and nursing the host. **Yanxue Lai** (87169312@163.com), Ningbo Forest Pest Control and Quarantine Station, Ningbo, China

11:00 **1175** The impact of DNA methylation to insect fitness on host-plant resistance: A case study on *Aphis glycines*. **Xianliang Huang** (xlhuang2014@nwsuaf.edu.cn) and Andrew Michel, The Ohio State Univ., Wooster, OH

10-min: PBT, Insecticide Resistance

Meeting Room 506 (Convention Center)

Moderators: Yasmine Farhan[1] and Brad Coates[2], [1]Univ. of Guelph, St. Thomas, ON, Canada, [2]USDA - ARS, Ames, IA

9:00 **1176** Field evolved resistance of arthropods to pesticides: An analysis of resistance adaptation from 1914 to 2017. **David Mota-Sanchez** (motasanc@msu.edu) and John Wise, Michigan State Univ., East Lansing, MI

9:10 **1177** Quantitative trait locus mapping of *Bacillus thuringiensis* (Bt) toxin resistance traits using high density genotyping-by-sequencing markers. **Brad Coates** (brad.coates@ars.usda.gov)[1], Aaron Gassmann[2] and Blair Siegfried[3], [1]USDA - ARS, Ames, IA, [2]Iowa State Univ., Ames, IA, [3]Univ. of Florida, Gainesville, FL

9:20 **1178** Transcriptional effects of diet on Bt susceptibility in the polyphagous agricultural pest *Helicoverpa zea*. **Carrie Deans** (cadeans@tamu.edu)[1], Spencer T. Behmer[2], Gregory Sword[2] and Heiko Vogel[3], [1]Univ. of Minnesota, St. Paul, MN, [2]Texas A&M Univ., College Station, TX, [3]Max Planck Institute for Chemical Ecology, Jena, Germany

9:30 **1179** Development of an insecticide rotation for resistance management for Asian citrus psyllid *Diaphorina citri* Kuwayama in Florida. **Xue Dong Chen** (xuedongc@yahoo.com) and Lukasz Stelinski, Univ. of Florida, Lake Alfred, FL

9:40 **1180** Integrative genomic and transcriptomics identifies genetic markers associated with resistance to teflubenzuron in fall armyworm (*Spodoptera frugiperda*). **Antonio Rogério Nascimento** (arbnascimento@usp.br)[1], Vitor Pavinato[2], Juliana Gonzales Rodrigues[1], Fernando Cônsoli[1], Celso Omoto[1] and Andrew Michel[2], [1]Univ. de São Paulo, Piracicaba, Brazil, [2]The Ohio State Univ., Wooster, OH

9:50 **1181** New challenges and new opportunities in IRM for transgenic insecticidal crops. **Rick Roush** (rtr10@psu.edu), Pennsylvania State Univ., University Park, PA

10:00 **Break**

10:10 **1182** Baseline susceptibility of western bean cutworm (Lepidoptera: Noctuidae) in Ontario, Canada to Vip3A *Bacillus thuringiensis* protein. **Yasmine Farhan** (yfarhan@uoguelph.ca)[1], Jocelyn Smith[2] and Arthur Schaafsma[2], [1]Univ. of Guelph, St. Thomas, ON, Canada, [2]Univ. of Guelph, Ridgetown, ON, Canada

10:20 **1183** Fungicides as inadvertent drivers of insecticide resistance in Colorado potato beetles (*Leptinotarsa decemlineata*). **Justin Clements** (jclements2@wisc.edu)[1], Dries Amezian[1], Anna Clements[1], Tabatha Davis[1], Benjamin Sanchez-Sedillo[1], Anders Huseth[2], Sean Schoville[1], Christopher Bradfield[1] and Russell Groves[1], [1]Univ. of Wisconsin, Madison, WI, [2]North Carolina State Univ., Raleigh, NC

10:30 **1184** A plant-based method for determining western corn rootworm resistance to traits. **Zhimou Wen** (zhimou.wen@syngenta.com) and Jeng Chen, Syngenta Crop Protection, Research Triangle Park, NC

10:40 **1185** Isoclast™ active: An effective tool for insecticide resistance management in China and Taiwan. Peng Wang[1], Ta-i Huang[2], Jimmy Huang[1], George Guan-Hua Lin[3], Steven Liu[1], Chunhe Qu[1], Catherine Ren[1], Ray Xie[1], Paige Oliver[1] and **Jim X. Huang** (jxhuang@dow.com)[4], [1]Dow AgroSciences, Shanghai, China, [2]Dow AgroSciences, Taipei, TN, [3]Dow AgroSciences, PingTung, Taiwan, [4]Dow AgroSciences, Indianapolis, IN

10:50 **1186** Magnetic responses of a migratory rice planthopper to changes in geomagnetic field: From physiology to behaviour. **Guijun Wan** (guijunwan@njau.edu.cn)[1], Ming Zhang[1], Jingjing Xu[2], Manqiang Liu[1], Weidong Pan[2], Gregory Sword[3] and Fajun Chen[1], [1]Nanjing Agricultural Univ., Nanjing, China, [2]Chinese Academy of Sciences, Beijing, China, [3]Texas A&M Univ., College Station, TX

10-min: PBT, Toxicology

Meeting Room 402 (Convention Center)

Moderators: Niranjana Krishnan and Colin Wong, Iowa State Univ., Ames, IA

9:00 **1187** Analysis of activity of monoterpenoid plant compounds on acetylcholine receptors. **Colin Wong** (cwong1@iastate.edu), Joel R. Coats and Richard Martin, Iowa State Univ., Ames, IA

9:10 **1188** Characterizing the spectrum of activity of IPD072Aa: A novel protein active on *Diabrotica virgifera virgifera*. **Chad Boeckman** (chad.boeckman@pioneer.com), DuPont Pioneer, Johnston, IA

9:20 **1189** Mode of action studies of *Bacillus thuringiensis* Cry34/35Ab1 in western corn rootworm (*Diabrotica virgifera virgifera* LeConte). **Huarong Li** (hli2@dow.com)[1], Andrew Bowling[1], Heather Pence[1], Sek Yee Tan[1], David McCaskill[1], Haichuan Wang[2], Steve Evans[1], Blair Siegfried[3] and Kenneth Narva[1], [1]Dow AgroSciences, Indianapolis, IN, [2]Univ. of Nebraska, Lincoln, NE, [3]Univ. of Florida, Gainesville, FL

9:30 **1190** Assessing risks of insecticides used in corn and soybean production on monarch butterfly (*Danaus plexippus*) larvae. **Niranjana Krishnan** (nkrish@iastate.edu)[1], Keith Bidne[2], Richard Hellmich[2], Joel R. Coats[1] and Steven Bradbury[1], [1]Iowa State Univ., Ames, IA, [2]USDA - ARS, Ames, IA

9:40 **1191** Toxicological assessment of lady beetle neonates under laboratory and field conditions. **Zunnu Akhtar** (zunnuraenakhtar@gmail.com), Univ. of Agriculture, Faisalabad, Pakistan

9:50 **1192** Presentation withdrawn

10:00 **1193** Efficacy of some insecticides against cotton mealy bug, *Phenacoccus solenopsis* Tinsely and its natural enemies. **Hassan Kannan** (hkannan_4@hotmail.com), Agricultural Research Corporation, Wad Madani, Sudan

10:10 **1194** Characterizing the environmental safety of IPD072Aa using non-target organisms. **Kristine Sturtz** (kristine.sturtz@pioneer.com), DuPont Pioneer, Johnston, IA

10:20 **2222** Fipronil enhanced natural occurrence of *Fusarium solani* (Hypocreales: Nectriaceae) on *Heterotermes indicola* Wasmann (Blattodea: Rhinotermitidae). **Muhammad Afzal** (afzal@bs.qau.edu.pk) and Naveeda Qureshi, Quaid-i-Azam Univ., Islamabad, Pakistan

10-min: P-IE, Biocontrol, Parasitoids

Meeting Room 505 (Convention Center)

Moderators: Kristopher Abell[1] and Paul Botch[2], [1]Univ. of Maryland, College Park, MD, [2]Michigan State Univ., East Lansing, MI

9:00 **1195** Parasitism of cereal aphids by *Lysiphlebus testaceipes* in wheat field edges and interiors. **Norman Elliott** (norman.elliott@ars.usda.gov)[1], Michael Brewer[2] and Kris Giles[3], [1]USDA - ARS, Stillwater, OK, [2]Texas A&M Univ., Corpus Christi, TX, [3]Oklahoma State Univ., Stillwater, OK

9:10 **1196** Molecular tools in biocontrol: Discovery of host-parasitoid associations in the Pentatomidae. **Tara Gariepy** (tara.gariepy@agr.gc.ca), Agriculture and Agri-Food Canada, London, ON, Canada

9:20 **1197** Emerald ash borer (*Agrilus planipennis*) and its parasitoids in the aftermath of invasion in Maryland. **Kristopher Abell** (abellkris@gmail.com)[1], Jian Duan[2], David E. Jennings[1] and Paula M. Shrewsbury[1], [1]Univ. of Maryland, College Park, MD, [2]USDA - ARS, Newark, DE

9:30 **1198** *Diaeretiella rapae* (McIntosh) (Hymenoptera: Braconidae) found parasitizing sugarcane aphid, *Melanaphis sacchari* (Zehntner) (Hemiptera: Aphididae), in greenhouse in Georgia. **Sriyanka Lahiri** (sriyanka.lahiri@uga.edu)[1], Michael Toews[1], Norman Elliott[2] and Xinzhi Ni[3], [1]Univ. of Georgia, Tifton, GA, [2]USDA - ARS, Stillwater, OK, [3]USDA - ARS, Tifton, GA

9:40 **1199** A model study showing the benefits of systematics in biocontrol. Leanne Peixoto[1], Geoff Allen[2], Stephen Quarrell[2], Toni Withers[3], **Ryan Ridenbaugh** (r.ridenbaugh@knights.ucf.edu)[4] and Barbara Sharanowski[4], [1]Univ. of Manitoba, Winnipeg, MB, Canada, [2]Univ. of Tasmania, Hobart, Australia, [3]Scion and Better Border Biosecurity Collaboration, Rotorua, New Zealand, [4]Univ. of Central Florida, Orlando, FL

9:50 **1200** Seasonal abundance, identification and comparative parasitism of larval and pupal parasitoids of diamond backed moth (*Plutella xylostella* L.) on cauliflower. **Asim Gulzar** (asim@uaar.edu.pk)[1], Hussain Bakhsh[1] and Muhammad Ali[2], [1]Pir Mehr Ali Shah Arid Agriculture Univ., Rawalpindi, Pakistan, [2]Univ. of the Punjab, Lahore, Pakistan

10:00 **1201** Host suitability of the sugarcane stem borers *Diatraea* spp. (Lepidoptera: Crambidae) for two tachinid parasitoids explains a regional pest outbreak in Colombia. Viviana Aya-Vargas[1], James Montoya-Lerma[1], Claudia Echeverri-Rubiano[2] and **German Vargas** (gavargas@cenicana.org)[2], [1]Univ. del Valle, Cali, Colombia, [2]Colombian Sugarcane Research Center, Cali, Colombia

10:10 **1202** Potential co-existence of native and exotic parasitoids and their impact on control of *Halyomorpha halys*. Joanna Konopka[1], **Tim Haye** (t.haye@cabi.org)[2], Tara Gariepy[3] and Jeremy McNeil[4], [1]Western Univ., London, ON, Canada, [2]CABI, Delémont, Switzerland, [3]Agriculture and Agri-Food Canada, London, ON, Canada, [4]Univ. of Western Ontario, London, ON, Canada

10:20 **1203** Effects of pentatomid egg age on host acceptance, development and longevity of offspring for *Trissolcus japonicus*. **Paul Botch** (botchpau@msu.edu) and Ernest Delfosse, Michigan State Univ., East Lansing, MI

10:30 **Break**

10:40 **1204** Does placement of sentinel eggs on plant species affect success in attracting parasitoids? **Ernest Delfosse** (delfosse@cns.msu.edu) and Paul Botch, Michigan State Univ., East Lansing, MI

10:50 **1205** Classical biological control of Asian citrus psyllid with *Diaphorencyrtus aligarhensis* in urban southern California. **Ivan Milosavljevi** (ivanm@ucr.edu) and Mark S. Hoddle, Univ. of California, Riverside, CA

11:00 **1206** Biological control of the pink hibiscus mealybug, *Maconellicoccus hirsutus* (Hemiptera: Pseudococcidae), in the Coachella Valley. **Sharon Andreason** (sharona@ucr.edu)[1], William Roltsch[2] and Thomas M. Perring[1], [1]Univ. of California, Riverside, CA, [2]California Dept. of Food and Agriculture, Sacramento, CA

11:10 **1207** Reported natural enemies of some food crop insect pests in North Kordofan and the climatological effect on *Eurytoma* sp. **Esameldin Kabbashi** (esameldinkabbashi@gmail.com), The National Food Research Center, Khartoum North, Sudan

11:20 **1208** Progress of BMSB biocontrol research in CA. **Jesus Lara Artiga** (jlara007@ucr.edu)[1], Charles Pickett[2] and Mark S. Hoddle[1], [1]Univ. of California, Riverside, CA, [2]California Dept. of Food and Agriculture, Sacramento, CA

11:30 **1209** Presentation withdrawn

11:40 **1210** Adult parasitism of the koinobiont pupal parasitoid *Tetrastichus brontispae*. **Keiji Takasu** (takasu@brs.kyushu-u.ac.jp), Kyushu Univ., Fukuoka, Japan

11:50 **1211** Establishment of *Trissolcus japonicus*, a parasitoid of *Halyomorpha halys*, in Oregon. **David Lowenstein** (david.lowenstein@oregonstate.edu) and Nik G. Wiman, Oregon State Univ., Aurora, OR

10-min: P-IE, IPM, Field Crops 1

Meeting Room 403 (Convention Center)

Moderators: Fikru Haile[1] and Julien Beuzelin[2], [1]DuPont Pioneer, Johnston, IA, [2]Univ. of Florida, Belle Glade, FL

9:00 **1212** Effect of fungicide applications on *Beauveria bassiana* infecting *Megacopta cribraria* in soybean. **Ian Knight** (ian.knight88@gmail.com)[1], Alana Jacobson[2] and Michael Toews[1], [1]Univ. of Georgia, Tifton, GA, [2]Auburn Univ., Auburn, AL

9:10 **1213** Chemigation for management of stink bugs. **Michael Toews** (mtoews@uga.edu) and Xing Wei, Univ. of Georgia, Tifton, GA

9:20 **1214** Exploring the relationship between temperature and growth rate for tadpole shrimp (*Triops longicaudatus*) and its implications for California rice farmers. **Joanna Bloese** (jbbloese@ucdavis.edu), Kevin Goding and Larry Godfrey, Univ. of California, Davis, CA

9:30 **1215** A review of *Spodoptera frugiperda* host strains/forms: Implications for pest management. **Herbert Eichenseer** (herb.eichenseer@pioneer.com), Margit Ross and Jared Ostrem, Pioneer Hi-Bred International, Inc, Johnston, IA

9:40 **1216** Interaction of maize genotypes with Bt protein and strategies in the control of lepidopteran pests. **Flávio Jesus** (flavio.jesus@ifgoiano.edu.br), Cinthia Luzia Teixeira, Lígia Paiva, Franciele Cristina Silva, Fernanda Correa, Ana Paula Pelosi and André Cirilo Almeida, Instituto Federal Goiano, Urutaí, Brazil

9:50 **1217** Contrasting soybean defoliation and pod feeding injuries by *Helicoverpa zea* and *Helicoverpa armigera*. **Fikru Haile** (fikru.haile@pioneer.com)[1], Josemar Foresti[2] and Timothy M. Nowatzki[1], [1]DuPont Pioneer, Johnston, IA, [2]DuPont Pioneer, Brazilia, DE, Brazil

10:00 **1218** Novel insecticidal proteins from plants for crop protection against major lepidopteran pests. **Lu Liu** (lu.liu@pioneer.com), DuPont Pioneer, Hayward, CA

10:10 **Break**

10:20 **1219** Seasonal abundance of *Lygus lineolaris* (Hemiptera: Miridae) on cultivated and weedy hosts in North Carolina cotton agroecosystems. **Anders Huseth** (ashuseth@ncsu.edu)[1], Bill Peele[2] and Allen Hubers[2], [1]North Carolina State Univ., Raleigh, NC, [2]Impact Agronomics Inc, Washington, NC

10:30 **1220** Damage by cotton fleahopper (Hemiptera: Miridae) on select glabrous, hirsute, and pilose cotton varieties. **Robert Bowling** (robert.bowling@ag.tamu.edu)[1], Michael Brewer[1], David Kerns[2], Darwin J. Anderson[1], Stephen Biles[3] and Blayne Reed[4], [1]Texas A&M Univ., Corpus Christi, TX, [2]Texas A&M Univ., College Station, TX, [3]Texas A&M Univ., Port Lavaca, TX, [4]Texas A&M Univ., Plainview, TX

10:40 **1221** Detection and management of an invasive pest new to Florida sugarcane: *Fulmekiola serrata* (Thysanoptera: Thripidae). **Julien Beuzelin** (jbeuzelin@ufl.edu)[1], Felipe Soto-Adames[2], Les Baucum[3], Hardev Sandhu[1], Wayne Davidson[4], Stewart Swanson[5] and Matthew VanWeelden[1], [1]Univ. of Florida, Belle Glade, FL, [2]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL, [3]United States Sugar Corporation, Clewiston, FL, [4]Florida Sugar Cane League, Inc, Clewiston, FL, [5]Univ. of Florida, LaBelle, FL

10:50 **1222** Corn seed treatments for control of the corn wireworm (Coleoptera: Elateridae). Ronald Cherry[1], Shine Taylor[2], Daniel W. Sherrod[3] and **Mike Karounos** (karounos@gmail.com)[1], [1]Univ. of Florida, Belle Glade, FL, [2]DuPont Crop Protection, Bradenton, FL, [3]DuPont Crop Protection, Memphis, TN

11:00 **1223** Identification and population phenology of sugarcane aphid predators and parasitoids in grain sorghum and Johnson grass in Central Texas. **Crys Wright** (cwright02@tamu.edu), Keyan Zhu-Salzman and Raul F. Medina, Texas A&M Univ., College Station, TX

11:10 **1224** Overcoming spider mite outbreaks in water-stressed conditions with drought-tolerant corn hybrids. **Ricardo Ramirez** (ricardo.ramirez@usu.edu), Utah State Univ., Logan, UT

10-min: P-IE, Outreach and Teaching

Meeting Room 507 (Convention Center)

Moderator: David Held, Auburn Univ., Auburn, AL

9:00 **1225** Use of introductory biology students to examine the effect of host plant on caterpillar gut microbes. **Evan Lampert** (evan.lampert@ung.edu), Swapna Bhat and Jeanelle M. Morgan, Univ. of North Georgia, Oakwood, GA

9:10 **1226** From conception to submission: Course-based undergraduate research experience using a mole cricket-nematode interaction. **Pablo Allen** (pabloallen@ufl.edu), Christine Miller and Adam Dale, Univ. of Florida, Gainesville, FL

9:20 **1227** Self-efficacy, insects, and STEM summer camps for girls. **E. Dale Broder** (edalebroder@gmail.com)[1], Kirsten Fetrow[2], Shannon Murphy[1], Robin Tinghitella[1], Jennifer Hoffman[1] and Quyen Hart[3], [1]Univ. of Denver, Denver, CO, [2]Univ. of Denver, Castle Rock, CO, [3]Regis Univ., Denver, CO

9:30 **1228** Using Nepris to teach entomology-related topics in schools via video conferencing. **William Moar** (william.moar@monsanto.com), Monsanto Company, St. Louis, MO

9:40 **1229** Ignite and inspire beyond our borders: Lessons and highlights from international outreach. **David Held** (dwh0004@auburn.edu), Auburn Univ., Auburn, AL

9:50 **1230** Turning youth on to entomology and flipping their entomological switch. **John Guyton** (j.guyton@msstate.edu) and Breanna Lyle, Mississippi State Univ., Mississippi State, MS

10:00 **1231** Empowering students, engaging communities: Dow AgroSciences Science Ambassadors elevate STEM awareness through outreach and activities. **Ronda L. Hamm** (rlhamm@dow.com), Dow AgroSciences, Indianapolis, IN

10:10 **1232** How to accomplish outreach to the general public on small budget. **Christy LeDuc** (cmlebugg@gmail.com), Bugs and Bugs, Winter Garden, FL

10:20 **1233** Living acres: A biodiversity initiative to help farmers help monarch butterflies. **Jonathan Lelito** (jonathan.lelito@basf.com), BASF Corporation, Research Triangle Park, NC

10:30 **1234** Cricket-Palozza! Using crickets to build science skills and student confidence in the elementary classroom. **Lara Guerra** (lguerra@hockaday.org), The Hockaday School, Dallas, TX

10:40 **1235** Using mosquitoes to capture student attention and teach basic biological concepts. **Gregory D. Bisbee** (bisbee@arrowheadschools.org), Arrowhead High School, Hartland, WI

10-min: SysEB, Conservation and Biodiversity

Meeting Room 704/706 (Convention Center)

Moderators: Christy McCain[1] and Francis G. Howarth[2], [1]Univ. of Colorado, Boulder, CO, [2]Bishop Museum, Honolulu, HI

9:00 **1236** Carrion beetles (Silphidae) along elevational gradients in Colorado: A test of diversity hypotheses. **Christy McCain** (christy.mccain@colorado.edu), Univ. of Colorado, Boulder, CO

9:10 **1237** Discovery of novel *Dignomus* (Coleoptera: Ptinidae) from sub-Saharan Africa. **Amelia Smith** (amelia.smith016@topper.wku.edu) and Keith Philips, Western Kentucky Univ., Bowling Green, KY

9:20 **1238** Ecosystem in a box - Arthropod communities in great tit nests along an urbanization gradient. **Lisa Furu Baardsen** (lisafuru.baardsen@uantwerpen.be), Univ. of Antwerp, Antwerp, Belgium

9:30 **1239** Collecting diverse insects on a long road trip through the summer 2017 with special attention to non-native species. **Alicia Bray** (brayalic@gmail.com), Central Connecticut State Univ., New Britain, CT

9:40 **1240** Biodiversity of native and introduced arthropod species in high elevation habitats on the Big Island of Hawai`i. **Matthew J. Medeiros** (matt.j.medeiros@gmail.com)[1], William Haines[2], Clare Aslan[3], Mia Carleton[4], Jonah Fleishhacker[4], Julia Ma[4], Aaron Shiels[5] and Christina Liang[6], [1]Univ. of California, Berkeley, CA, [2]Univ. of Hawai'i, Honolulu, HI, [3]Northern Arizona Univ., Flagstaff, AZ, [4]Urban School of San Francisco, San Francisco, CA, [5]USDA - APHIS, Fort Collins, CO, [6]USDA - Forest Service, Hili, HI

9:50 **1241** Field-scale exploration of invertebrate communities with metagenomic approaches: Detritivores in apple orchards. **Jason Matlock** (matlockj@msu.edu) and Matt Grieshop, Michigan State Univ., East Lansing, MI

10:00 **1242** Annual climate influences the abundance and phenology of potential pollinators for the endangered Otay tarplant (*Deinandra conjugens*). **Daniel A. Marschalek** (danmarschalek@hotmail.com) and Douglas Deutschman, San Diego State Univ., San Diego, CA

10:10 **1243** Effect of regime shift on soil insects. **Braj Sinha** (brajkishore58ranchi@gmail.com), Supriya Singh, Amita Hembrom and Neelam Tiwary, Ranchi Univ., Ranchi, India

10:20 **Break**

10:30 **1244** Regional and local processes of ground-dwelling beetle community assembly in urban greenspaces of Cleveland, Ohio. **Kayla I. Perry** (perry.1864@osu.edu)[1] and Mary Gardiner[2], [1]The Ohio State Univ., Wooster, OH, [2]The Ohio State Univ., Columbus, OH

10:40 **1245** Presentation withdrawn

10:50 **1246** Report of *Paederus specious* in Iran, Mazandaran and Fars Provinces, 2012- 2013. **Sahar Bazrafkan** (bazrafcan@yahoo.com), Tehran Univ. of Medical Sciences, Tehran, Iran

11:00 **1247** A half century underground: Illuminating the hidden biodiversity of caves. **Francis G. Howarth** (fhowarth@bishopmuseum.org), Bishop Museum, Honolulu, HI

11:10 **1248** Mid mesozoic insect fossils elucidate courtship, mating and reproduction. **Chungkun Shih** (chungkun.shih@gmail.com)[1], Taiping Gao[2], Conrad Labandeira[1] and Dong Ren[2], [1]Smithsonian Institution, Washington, DC, [2]Capital Normal Univ., Beijing, China

11:20 **1249** Plant-Insect associations of the Kaiparowits Formation, Late Cretaceous (Campanian) of Utah. **S. Augusta Maccracken** (gussie@umd.edu)[1,2], Ian Miller[3], Charles Mitter[2] and Conrad Labandeira[1], [1]Smithsonian Institution, Washington, DC, [2]Univ. of Maryland, College Park, MD, [3]Denver Museum of Nature and Science, Denver, CO

11:30 **1250** Sudden appearance and population outbreak of *Eunica monima* (Lepidoptera: Nymphalidae) on Desecheo Island, Puerto Rico. **Aaron Shiels** (aaron.b.shiels@aphis.usda.gov)[1], William Haines[2], Kirsty Swinnerton[3], Susan Silander[4], Cielo Figuerola-Hernández[3], David Will[3], Juan García-Cancel[5] and Christian Torres-Santana[6], [1]USDA - APHIS, Fort Collins, CO, [2]Univ. of Hawai'i, Honolulu, HI, [3]Island Conservation, Santa Cruz, CA, [4]U.S. Fish and Wildlife Service, Cabo Rojo, PR, [5]Texas Tech Univ., Lubbock, TX, [6]Fundación Luis Muñoz Marín, San Juan, PR

10-min: SysEB, Genetics, Behavior and Ecology of Social Insects

Meeting Room 702 (Convention Center)

Moderator: Chelsea N. Cook, Arizona State Univ., Tempe, AZ

9:00 **1251** Latent inhibition: Exploring the link between physiology, learning, and foraging behavior in honeybees. **Chelsea N. Cook** (cncook1@asu.edu)[1], Colin Brent[2], Noa Pinter-Wollman[3] and Brian Smith[1], [1]Arizona State Univ., Tempe, AZ, [2]USDA - ARS, Maricopa, AZ, [3]Univ. of California, Los Angeles, CA

9:10 **1252** The ecological underpinnings of social plasticity in small carpenter bees across a latitudinal gradient. **Sarah P. Lawson** (sarah.lawson@unh.edu) and Sandra Rehan, Univ. of New Hampshire, Durham, NH

9:20 **1253** A comparative genomic approach to understanding the genes underlying symbiont-induced reproductive manipulations in *Cardinium hertigii*. Corinne Stouthamer[1], Evelyne Mann[2], Suzanne Kelly[1], Stephan Schmitz-Esser[3] and **Martha Hunter** (mhunter@ag.arizona.edu)[1], [1]Univ. of Arizona, Tucson, AZ, [2]Univ. of Veterinary Medicine, Vienna, Austria, [3]Iowa State Univ., Ames, IA

9:30 **1254** Evidence for strong divergent selection among *Bombus bifarius* transcriptomes reveals a candidate gene for color pattern polymorphism. **Jeffrey Lozier** (jlozier@ua.edu), Meaghan Pimsler and Jason Jackson, Univ. of Alabama, Tuscaloosa, AL

9:40 **1255** Genetic mechanism underlying adaptive variation of bumblebee mimetic coloration. Li Tian, **Heather M. Hines** (hmh19@psu.edu), Sarthok Rahman and Briana Ezray, Pennsylvania State Univ., University Park, PA

9:50 **1256** Stable isotope evidence for divergent nutritional ecology with paper wasp colonies. **Sean O'Donnell** (so356@drexel.edu), Paula Zelanko and David Velinsky, Drexel Univ., Philadelphia, PA

10:00 **1257** The effect of the gut microbiome on honey bee learning and memory. **Svjetlana Vojvodic** (vojvodic@rowan.edu), Rowan Univ., Glassboro, NJ

10:10 **1258** Parasite manipulating hosts: *Nosema ceranae* infected honey bee workers are more easily accepted by non-nestmates. **Zachary Y. Huang** (bees@msu.edu) and Yujie Li, Michigan State Univ., East Lansing, MI

10:20 **1259** Regulation of reproductive division of labor in bumble bees – A solved puzzle or an ongoing mystery? Ahja Brown and **Etya Amsalem** (eua6@psu.edu), Pennsylvania State Univ., University Park, PA

10-min: SysEB, Systematics, Biodiversity, and Biology of Ants

Meeting Room 601 (Convention Center)

Moderator: Jacob Russell, Drexel Univ., Philadelphia, PA

9:00 **1260** Cryptic divergence on Florida's sand ridges: A new trap-jaw ant species. **Daniela Sorger** (dmsorger@ncsu.edu)[1,2], Adrian A. Smith[2], Warren Booth[3] and Robert Dunn[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina Museum of Natural Sciences, Raleigh, NC, [3]Univ. of Tulsa, Tulsa, OK

9:10 **1261** Phylogenomic reconstruction of *Formica* wood-ants reveals a single origin of dependent colony foundation and repeated dispersal between the Old and New World. **Marek Borowiec** (petiolus@gmail.com) and Christian Rabeling, Arizona State Univ., Tempe, AZ

9:20 **1262** Presentation withdrawn

9:30 **1263** Intracolony transmission of the microsporidian pathogen (*Myrmecomorba nylanderiae*) and its impact upon the growth of tawny crazy ant (*Nylanderia fulva*) colonies. **Edward LeBrun** (edwardlebrun@austin.utexas.edu), Kristina Ottens and Lawrence Gilbert, Univ. of Texas, Austin, TX

9:40 **1264** 50 million years of nitrogen-recycling in the multi-partite gut symbiosis of cephalotine ants. **Jacob Russell** (jar337@drexel.edu)[1], Yi Hu[1], Jon G. Sanders[2], John Wertz[3], Philipp Engel[4], Corrie Moreau[5] and Piotr Lukasik[1], [1]Drexel Univ., Philadelphia, PA, [2]Harvard Univ., Cambridge, MA, [3]Calvin College, Grand Rapids, MI, [4]Univ. de Lausanne, Lausanne, Switzerland, [5]The Field Museum of Natural History, Chicago, IL

9:50 **1265** Presentation withdrawn

10:00 **1266** Who are the 'lazy' ants? Inter-worker variation gives insight into potential functions of inactivity. **Daniel Charbonneau** (charbonneau.daniel@gmail.com) and Anna Dornhaus, Univ. of Arizona, Tucson, AZ

10:10 **Break**

10:20 **1267** Destruction of spider webs and release of ensnared nestmates by specialized workers of the desert seed harvesting ant, *Veromessor pergandei*. **Christina Kwapich** (ckwapich@asu.edu) and Bert Hölldobler, Arizona State Univ., Tempe, AZ

10:30 **1268** Ant suppression reduces biological control potential in grasslands. **Bill Wills** (willsbd@gmail.com)[1], Tania Kim[2], Claudio Gratton[2] and Douglas A. Landis[1], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Wisconsin, Madison, WI

10:40 **1269** Ant elevational range sizes increase with seasonal variation across latitudes, but show no consistent patterns across elevations. **Tim Szewczyk** (tim.szewczyk@gmail.com) and Christy McCain, Univ. of Colorado, Boulder, CO

10:50 **1270** Does ant nest architecture affect efficiency? **Walter R. Tschinkel** (tschinkel@bio.fsu.edu), Florida State Univ., Tallahassee, FL

11:00 **1271** Behavioral responses by *Solenopsis invicta* Buren workers to recognition chemicals in monogyne and polygyne colonies. **Jason Carbaugh** (jason.r.carbaugh@gmail.com)[1], Robert Renthal[2], S. Bradleigh Vinson[3] and Raul F. Medina[3], [1]Ripon College, Ripon, WI, [2]Univ. of Texas, San Antonio, TX, [3]Texas A&M Univ., College Station, TX

11:10 **1272** Effects of object mass and size on group success during cooperative transport in *Paratrechina longicornis* ants. **Helen McCreery** (helen.mccreery@colorado.edu), Univ. of Colorado, Boulder, CO

Late-Breaking Organized Meeting: ESA Briefing on the USDA Listening Session on Native Pollinator Monitoring

Meeting Room 707 (Convention Center)

Moderator and Organizer: Rosalind James, USDA - ARS, Beltsville, MD

11:00 **1273** The USDA's role in coordinating federal efforts to monitor native bees. **Rosalind James** (rosalind.james@ars.usda.gov)[1], Mary Purcell-Miramontes[2], Kevin Hackett[1], Christina Liang[3], Monica Tomosy[4], Robyn Rose[5] and Heather Moylett[5], [1]USDA - ARS, Beltsville, MD, [2]USDA - NIFA, Washington, DC, [3]USDA - Forest Service, Hili, HI, [4]USDA - Forest Service, Washington, DC, [5]USDA - APHIS, Riverdale, MD

10-min: MUVE, Structural Pests

Meeting Room 607 (Convention Center)

Moderators: Rachel Ann Arango[1] and Samantha Smith[2], [1]USDA - Forest Service, Madison, WI, [2]Northwestern State Univ., Natchitoches, LA

11:00 **1274** Uricolytic activity by termite-gut associated Actinobacteria: Potential role in nitrogen conservation by subterranean termites. **Rachel Ann Arango** (rarango@fs.fed.us)[1], Frederick Green[1], Vina Yang[1], Joliene Lindholm[2,3], Nathaniel Chotlos[3] and Kenneth Raffa[3], [1]USDA - Forest Service, Madison, WI, [2]Promega Corporation, Madison, WI, [3]Univ. of Wisconsin, Madison, WI

11:10 **1275** Detecting drywood termites in structures using microwave technology (Termatrac). **Siavash Taravati** (staravati@ucanr.edu), Univ. of California, Alhambra, CA

11:20 **1276** "That baby ain't that cute": Developmental instability in young termite colonies. **Thomas Chouvenc** (tomchouv@ufl.edu) and Nan-Yao Su, Univ. of Florida, Davie, FL

11:30 **1277** Nitrogen inventories and nitrogenase expression rates of a drywood and a subterranean termite. **Aaron Mullins** (amull81@ufl.edu)[1] and Nan-Yao Su[2], [1]Univ. of Florida, Fort Lauderdale, FL, [2]Univ. of Florida, Davie, FL

11:40 **1278** Foraging distance and caste composition of incipient colonies of the Formosan subterranean termite (Isoptera: Rhinotermitidae) in laboratory extended arenas. **Nan-Yao Su** (nysu@ufl.edu)[1], Weste Osbrink[2], Garima Kakkar[3], Aaron Mullins[4] and Thomas Chouvenc[1], [1]Univ. of Florida, Davie, FL, [2]USDA - ARS, Kerrville, TX, [3]Univ. of Florida, Fort Pierce, FL, [4]Univ. of Florida, Fort Lauderdale, FL

11:50 **1279** Adventures in Louisiana's termite world (*Coptotermes formosanus*). **Adrian Juttner** (adriantree@aol.com), Self-Employed, Abita Springs, LA

12:00 **1280** Effects of epigallocatechin gallate and caffeine in combination with boron on *Reticulitermes flavipes* (Isoptera: Rhinotermitidae). Mark E. Mankowski[1], Carol Clausen[2] and **Rachel Ann Arango** (rarango@fs.fed.us)[2], [1]USDA - Forest Service, Starkville, MS, [2]USDA - Forest Service, Madison, WI

12:10 **1281** Persistence and degradation of termiticide under field trials in Pakistan. **Farkhanda Manzoor** (drfarkhanda786@gmail.com), Lahore College for Women Univ., Lahore, Pakistan

12:20 **1282** Homology cloning identifies putative delta-latroinsectotoxin in the brown widow spider (*Latrodectus geometricus*). **Samantha Smith** (ssmith031728@nsula.edu) and Lindsay Porter, Northwestern State Univ., Natchitoches, LA

10-min: MUVE, Vector Control

Meeting Room 503 (Convention Center)

Moderators: Ephantus Muturi[1] and Todd P. Livdahl[2], [1]USDA - ARS, Peoria, IL, [2]Clark Univ., Worcester, MA

11:00 **1283** Combined toxicity of three essential oils against *Aedes aegypti* (Diptera: Culicidae) larvae. **Ephantus Muturi** (ephantus.muturi@ars.usda.gov), Kenneth Doll and Jose Luis Ramirez, USDA - ARS, Peoria, IL

11:10 **1284** Presentation withdrawn

11:20 **1285** Studies on knockdown resistance (*kdr*) mutations in *Aedes aegypti* and *Ae. albopictus* in India. **Neera Kapoor** (neerakapoor@ignou.ac.in), Indira Gandhi National Open Univ., New Delhi, India

11:30 **1286** Residual efficacy of Fendona™ CS insecticide on three mosquito species (*Culex quinquefasciatus* (Say), *Aedes aegypti* (L), and *Anopheles quadrimaculatus* (Say)), provided by outdoor applications on vegetation commonly found in residential settings. **Bob Davis** (robert.davis@basf.com)[1] and Matthew Lee[2], [1]BASF Corporation, Pflugerville, TX, [2]Entomology Consultants, Mesilla Park, NM

11:40 **1287** Soil application of a formulated *Metarhizium brunneum* F52 (Hypocreales: Clavicipitaceae) containing microsclerotia controls eggs of *Aedes aegypti* (Diptera: Culicidae). **Lina Flor-Weiler** (lina.weiler@ars.usda.gov)[1], Robert Behle[1], Eric Johnson[1], Daniel Strickman[2] and Alejandro Rooney[1], [1]USDA - ARS, Peoria, IL, [2]Bill and Melinda Gates Foundation, Seattle, WA

11:50 **Break**

12:00 **1288** Presentation withdrawn

12:10 **1289** Vectrax: A multi-species semiochemical-based strategy for improved monitoring and control of vector mosquitoes. **Jesse Saroli** (jesse.saroli@iscatech.com)[1], Agenor Mafra-Neto[1], Teun Dekker[2], Woodbridge Foster[3], Rodrigo Silva[1], Graham White[4], William Urrutia[1], Leonard Mboera[5] and Elison Kemibala[5], [1]ISCA Technologies, Inc, Riverside, CA, [2]Swedish Univ. of Agricultural Sciences, Alnarp, Sweden, [3]The Ohio State Univ., Columbus, OH, [4]USDA - ARS, Gainesville, FL, [5]National Institute for Medical Research, Dar-es-Salaam, Tanzania

12:20 **1290** Fighting *Aedes aegypti* in the California desert. **Jennifer Henke** (jhenke@cvmvcd.org), Coachella Valley Mosquito and Vector Control District, Indio, CA

12:30 **1291** Field evidence for regulation of mosquito population density by a gregarine parasite. **Todd P. Livdahl** (tlivdahl@clarku.edu) and John Soghigian, Clark Univ., Worcester, MA

12:40 **1292** Treating the Great gerbil (*Rhombomys opimus*) with a fipronil-based bait in an effort to control the vectors of cutaneous leishmaniasis (*Leishmania major*) and bubonic plague (*Yersinia pestis*) in southern Kazakhstan. **David Poche** (davidp@genesislabs.com)[1], Zaria Torres-Poche[1], Aidyn Eszhanov[2], Larisa Polyakova[1] and Richard Poche[1], [1]Genesis Laboratories, Inc, Wellington, CO, [2]Kazakh Science Center for the Quarantine of Zoonotic Diseases, Almaty, Kazakhstan

10-min: P-IE, Climate Change, Climate Effects

Meeting Room 507 (Convention Center)

Moderators: Theresa Cira[1] and Erica Kistner[2], [1]Univ. of Minnesota, St. Paul, MN, [2]USDA - ARS, Ames, IA

11:00 **1293** *Cotesia vestalis* (Haliday) reduced basal and plastic responses to temperature may compromise efficacy of *Plutella xylostella* (L.) biological control under climate change. **Honest Machekano** (honest.machekano@studentmail.biust.ac.bw)[1], Brighton Mvumi[2] and Casper Nyamukondiwa[1], [1]Botswana International Univ. of Science and Technology, Palapye, Botswana, [2]Univ. of Zimbabwe, Harare, Zimbabwe

11:10 **1294** Improving herbivore phenological predictions by incorporating variation in host plant quality. **Mariana Abarca** (ma782@georgetown.edu)[1], Elise Larsen[1], John Lill[2], Martha Weiss[1], Eric Lind[3] and Leslie Ries[1], [1]Georgetown Univ., Washington, DC, [2]George Washington Univ., Washington, DC, [3]Univ. of Minnesota, St. Paul, MN

11:20 **1295** Climate change impacts on the invasive brown marmorated stink bug (Hemiptera: Pentatomidae) in North America. **Erica Kistner** (ekistnerphd2014@gmail.com), USDA - ARS, Ames, IA

11:30 **1296** Multitrophic interactions mediate the effects of climate change on herbivore abundance. **Emily Mooney** (emooney@uccs.edu)[1], Ayla Robinson[2], Maria Mullins[1] and James Den Uyl[1], [1]Univ. of Colorado, Colorado Springs, CO, [2]The Ohio State Univ., Columbus, OH

11:40 **1297** Aestivation and sheltering preferences of the melon bug, *Aspongopus viduatus* (Fabricius), in North Kordofan State, Sudan. **Ahmed Hammad** (ahmed7399@yahoo.com)[1], Mahgoub A. Alla[2], Elsyed Mohammed[1], Azhari Abdelbagi[1], Abd Elaziz Ishag[1] and Mark Laing[3], [1]Univ. of Khartoum, Khartoum, Sudan, [2]Univ. of Peace, Khartoum, Sudan, [3]Univ. of KwaZulu-Natal, Pietermaritzburg, South Africa

11:50 **1298** Urban heat island effects disrupt insect-plant interactions on street trees at multiple scales. **Dieter Hochuli** (dieter.hochuli@sydney.edu.au) and Tony Chen, Univ. of Sydney, Sydney, Australia

12:00 **1299** Comparison of bio-ecology of Mediterranean fruit fly, *Ceratitis capitata* Wiedemann (Diptera: Tephritidae), populations at different elevations. Serkan Kızılyamaç and **Serdar Satar** (hserhat@cu.edu.tr), Çukurova Univ., Adana, Turkey

12:10 **1300** *Halyomorpha halys* laboratory diapause induction and its effects on cold tolerance and feeding. **Theresa Cira** (cirax002@umn.edu)[1], Robert Koch[1], William Hutchison[1] and Robert Venette[2], [1]Univ. of Minnesota, St. Paul, MN, [2]USDA - Forest Service, St. Paul, MN

Tuesday, November 7, 2017 • AFTERNOON

Lunch and Learn: 1, 2…Eyes on You: Classroom Management, Crowd Control and How to Rock Any Outreach Presentation

Meeting Room 710/712 (Convention Center)

Moderator and Organizer: Kristie Reddick, The Bug Chicks, Portland, OR

12:15 PM - 1:15 PM

Lunch and Learn: Creative Writing for Entomologists: Short Forms and Little Creatures

Meeting Room 704/706 (Convention Center)

Moderator and Organizer: Jeffrey Lockwood, Univ. of Wyoming, Laramie, WY

12:15 PM - 1:15 PM

Lunch and Learn: ESA Publications "Ask Me Anything"

Meeting Room 703 (Convention Center)

Moderators and Organizers: Lauren Godwin[1], Dana Nayduch[2], William Reisen[3], Marlin Rice[4], Kevin Steffey[5] and James Whitfield[6], [1]Oxford Univ. Press USA, Cary, NC, [2]USDA - ARS, Manhattan, KS, [3]Univ. of California, Davis, CA, [4]Syngenta Crop Protection, Research Triangle Park, NC, [5]Dow AgroSciences, Indianapolis, IN, [6]Univ. of Illinois, Champaign, IL,

12:15 PM - 1:15 PM

Student Debates: The Anthropocene: Implications for Arthropods and Biodiversity

Four Seasons Ballroom (Convention Center)

Moderators and Organizers: Alix Whitener[1] and Casey Parker[2], [1]Washington State Univ., Wenatchee, WA, [2]Univ. of Florida, Vero Beach, FL

1:00 **1301** The Anthropocene: Implications for arthropods and biodiversity. **Alix Whitener** (alix.crilly@wsu.edu)[1] and **Casey Parker** (caseyparker@ufl.edu)[2], [1]Washington State Univ., Wenatchee, WA, [2]Univ. of Florida, Vero Beach, FL

1:10 **1302** Unbiased introduction, Virginia Polytechnic Institute and State University, Topic 1: What is the most important threat to global arthropod biodiversity? **Chris McCullough** (ctmccull@gmail.com), Virginia Polytechnic Institute and State Univ., Blacksburg, VA

1:15 **1303** Team 1: The Midgrass Prairie Regional Team (faculty advisor - Jonathan Lundgren), Topic 1. **Ryan Schmid** (rbschmid@ksu.edu)[1], **Jessica Thomson** (jessiel@ksu.edu)[1], **Jacob Pecenka** (jacob.pecenka@gmail.com)[2], **Michael Bredeson** (michael.bredeson@sdstate.edu)[3] and **Grace Craigie** (craigieg@ksu.edu)[1], [1]Kansas State Univ., Manhattan, KS, [2]Purdue Univ., West Lafayette, IN, [3]Ecdysis Foundation, Brookings, SD

1:22 **Cross-Examination of Team 1 by Team 2 for Topic 1**

1:25 **1304** Team 2: Washington State University (faculty advisor - Jeb Owen), Topic 1. **Adekunle Adesanya** (adekunle.adesanya@wsu.edu)[1], **Abigail Hayes** (abigail.hayes@wsu.edu)[1], **Adrian Marshall** (atmarshall@wsu.edu)[2], **James Hepler** (james.hepler@wsu.edu)[2] and **Abigail Cohen** (abigail.cohen@wsu.edu)[1], [1]Washington State Univ., Pullman, WA, [2]Washington State Univ., Wenatchee, WA

1:32 **Cross-Examination of Team 2 by Team 1 for Topic 1**

1:35 **First Rebuttal by Team 2 for Topic 1**

1:38 **First Rebuttal by Team 1 for Topic 1**

1:41 **Second Rebuttal by Team 2 for Topic 1**

1:44 **Second Rebuttal by Team 1 for Topic 1**

1:47 **Questions from Judges and Audience for Topic 1**

1:57 **Break**

2:06 **1305** Unbiased introduction, Louisiana State University and The Ohio State University, Topic 2: What is the most urgent and feasible use for CRISPR/Cas9 in entomology? **Emily Kraus** (ekraus@agcenter.lsu.edu)[1] and **Priyanka Mittapelly** (mittapelly.1@buckeyemail.osu.edu)[2], [1]Louisiana State Univ., Baton Rouge, LA, [2]The Ohio State Univ., Wooster, OH

2:11 **1306** Team 1: Purdue University (faculty advisor - Steve Yaninek), Topic 2. **Sara Stack** (librisardor25@me.com)[1], **Scott Gula** (sgula@purdue.edu)[2], **Hannah Quellhorst** (hquellho@purdue.edu)[1] and **Tyler Stewart** (stewar23@purdue.edu)[1], [1]Purdue Univ., West Lafayette, IN, [2]Xavier Univ., Cincinnati, OH

2:18 **Cross-Examination of Team 1 by Team 2 for Topic 2**

2:21 **1307** Team 2: Michigan State University (faculty advisor - Jim Smith), Topic 2. **Courtney Larson** (larso126@msu.edu), **Nicholas Babcock** (babco116@msu.edu), **Lidia Komondy** (lkomondy@msu.edu) and **Joseph Receveur** (receveur@msu.edu), Michigan State Univ., East Lansing, MI

2:28 **Cross-Examination of Team 2 by Team 1 for Topic 2**

2:31 **First Rebuttal by Team 2 for Topic 2**

2:34 **First Rebuttal by Team 1 for Topic 2**

2:37 **Second Rebuttal by Team 2 for Topic 2**

2:40 **Second Rebuttal by Team 1 for Topic 2**

2:43 **Questions from Judges and Audience for Topic 2**

2:53 **Break**

3:03 **1308** Unbiased introduction, Louisiana State University, Topic 3: What is the best way to increase beneficial insect diversity in urban areas? **Lina Bernaola** (lbernaola@agcenter.lsu.edu), Louisiana State Univ., Baton Rouge, LA

3:08 **1309** Team 1: Florida A&M University (faculty advisor - Raymond Hix), Topic 3. **Whitley Stewart** (stewartwhitley@yahoo.com), **Worrel Diedrick** (worrell1.diedrick@famu.edu), **Xavier Price** (xavier_price08@yahoo.com) and **Albertha Parkins** (alberthaparkins1@gmail.com), Florida A&M Univ., Tallahassee, FL

3:15 **Cross-Examination of Team 1 by Team 2 for Topic 3**

3:18 **1310** Team 2: Auburn University (faculty advisor - David Held), Topic 3. **Olufemi Ajayi** (osa0001@auburn.edu), **Selina Bruckner** (szb0130@auburn.edu), **Joseph Disi** (jod0003@auburn.edu) and **Tolulope Morawo** (tom0002@auburn.edu), Auburn Univ., Auburn, AL

3:25 **Cross-Examination of Team 2 by Team 1 for Topic 3**

3:28 **First Rebuttal by Team 2 for Topic 3**

3:31 **First Rebuttal by Team 1 for Topic 3**

3:34 **Second Rebuttal by Team 2 for Topic 3**

3:37 **Second Rebuttal by Team 1 for Topic 3**

3:40 **Questions from Judges and Audience for Topic 3**

3:50 **Concluding Remarks**

Program Symposium: Igniting the Spark: Science Communication by the Next Generation of Entomologists

Meeting Room 601 (Convention Center)

Moderators and Organizers: Rob Morrison[1], Kyndall Dye-Braumuller[2], Isobel Ronai[3], Amy C. Morey[4], Erika Machtinger[5], William R. Kuhn[6] and Ana Vélez[7], [1]USDA - ARS, Manhattan, KS, [2]Univ. of Kentucky, Lexington, KY, [3]Univ. of Sydney, Sydney, Australia, [4]Univ. of Minnesota, St. Paul, MN, [5]USDA - ARS, Beltsville, MD, [6]National Science Foundation, Knoxville, TN, [7]Univ. of Nebraska, Lincoln, NE

1:30 **Introductory Remarks**

1:35 **1311** How to talk to a reporter about your research. **Gwen Pearson** (gpearso@purdue.edu), Purdue Univ., West Lafayette, IN

1:50 **1312** Digitizing outreach: Adventures in creating an art + science website. **Carly M. Tribull** (cmt024@shsu.edu), Sam Houston State Univ., Huntsville, TX

2:05 **1313** Putting primary scientific research in the public eye through online video. **Adrian A. Smith** (adrian.smith@naturalsciences.org), North Carolina Museum of Natural Sciences, Raleigh, NC

2:20 **1314** Science communication and the social media echo chamber. **Jake E. Bova** (jbova86@vt.edu)[1] and Rea Manderino[2], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]State Univ. of New York, Syracuse, NY

2:35 **1315** Keynote: Recipes for making science appetizing. **Flora Lichtman** (flora.lichtman@gmail.com), Science Journalist and Host of Every Little Thing, Gimlet Media, Brooklyn, NY

3:05 **Break**

3:20 **1316** Why before how: Clarity of purpose and voice in SciComm. **Kristie Reddick** (contactus@thebugchicks.com), The Bug Chicks, Portland, OR

3:35 **1317** Communicating science to, and through, citizen scientists in entomology research. Louise Lynch and **Douglas Golick** (dgolick2@unl.edu), Univ. of Nebraska, Lincoln, NE

3:50 **1318** Influencing science policy requires adaptive and diverse communication. **Jennifer Gordon** (jrgordon@scj.com), SC Johnson & Son, Inc., Racine, WI

4:05 **1319** How to bug a conversation. **May Berenbaum** (maybe@illinois.edu), Univ. of Illinois, Champaign, IL

4:20 **Interactive Panel Discussion Q&A**

4:50 **Early Career Professionals Mixer**

Workshop: Insect Genome Editing: Why and How

Meeting Room 704/706 (Convention Center)

Moderators and Organizers: Marcé Lorenzen[1], Jennifer A. Brisson[2] and David O'Brochta[3], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of Rochester, Rochester, NY, [3]Univ. of Maryland, Rockville, MD

1:30 **1320** A functional CRISPR-Cas9 protocol in the pea aphid. Gael LeTrionnaire[1], Sylvie Tanguy[1], Sylvie Hudaverdian[1], Florence Gleonnec[1], Gautier Richard[1], Marilyne Uzest[2], **Denis Tagu** (denis.tagu@rennes.inra.fr)[1] and Amaury Herpin[3], [1]INRA, Le Rheu, France, [2]CIRAD - INRA, Montpellier, France, [3]INRA, Rennes, France

1:45 **1321** Genome editing with CRISPR-Cas9 in whiteflies. **Junbo Luan** (jl2957@cornell.edu)[1], Peter Atkinson[2], Linda Walling[2], Michael Han[2], Simran Sandhu[2], David O'Brochta[3] and Angela E. Douglas[1], [1]Cornell Univ., Ithaca, NY, [2]Univ. of California, Riverside, CA, [3]Univ. of Maryland, Rockville, MD

2:00 **1322** Genome editing in butterflies: Lessons from mosaic wing pattern mutants. **Arnaud Martin** (heliconiuswing@gmail.com), George Washington Univ., Washington, DC

2:15 **1323** Genome editing in beetles: Lessons learned from the red flour beetle. **Marcé Lorenzen** (marce_lorenzen@ncsu.edu), Nathaniel Grubbs, Nicole Gutzmann, Lauren Slayton, Fu-Chyun Chu and William Klobasa, North Carolina State Univ., Raleigh, NC

2:30 **1324** Genome editing in social insects: The clonal raider ant. **Waring Trible** (bucktrible@gmail.com), Ni-Chen Chang, Benjamin J. Matthews, Sean McKenzie, Leonora Olivos-Cisneros, Peter Oxley, Jonathan Saragosti and Daniel Kronauer, Rockefeller Univ., New York, NY

2:45 **1325** A practical how-to for CRISPR-Cas9 genome editing in insects. **William R. Reid** (wrreid@ncsu.edu) and Maxwell Scott, North Carolina State Univ., Raleigh, NC

MUVE Section Symposium: Advances in the Biology and Management of Modern Bed Bugs

Meeting Room 302/303 (Convention Center)

Moderators and Organizers: Stephen Doggett[1], Dini Miller[2] and Chow-Yang Lee[3], [1]NSW Health Pathology, Westmead, Australia, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [3]Univ. Sains Malaysia, Penang, Malaysia

1:30 **1326** Advances in the biology and management of modern bed bugs – A new text. **Stephen Doggett** (stephen.doggett@health.nsw.gov.au)[1], Dini Miller[2] and Chow-Yang Lee[3], [1]NSW Health Pathology, Westmead, Australia, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [3]Univ. Sains Malaysia, Penang, Malaysia

1:45 **1327** Stakes and silver bullets: Battling bed bugs through history. **Michael F. Potter** (mpotter@uky.edu), Univ. of Kentucky, Lexington, KY

2:00 **1328** Bed bugs in South America. **Roberto M. Pereira** (rpereira@ufl.edu)[1], Ana Eugênia Campos[2], João Justi[3] and Marcio Lage[4], [1]Univ. of Florida, Gainesville, FL, [2]Pesquisadora Científica, São Paulo, Brazil, [3]Unidade Laboratorial de Referênciaem Pragas Urbanas, São Paulo, Brazil, [4]Univ. de São Paulo, São Paulo, Brazil

2:15 **1329** The direct and indirect fiscal impacts of the bed bug resurgence on multiple industries (including pest control) around the world. **Dini Miller** (dinim@vt.edu)[1], Stephen Doggett[2] and Molly L. Wilson[1], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]NSW Health Pathology, Westmead, Australia

2:30 **1330** What makes bed bugs so important? **Michael Siva-Jothy** (m.siva-jothy@sheffield.ac.uk), Univ. of Sheffield, Sheffield, United Kingdom

2:45 **1331** The past, present, and future of bed bug population and evolutionary genetics. **Warren Booth** (warren-booth@utulsa.edu)[1], Edward Vargo[2] and Coby Schal[3], [1]Univ. of Tulsa, Tulsa, OK, [2]Texas A&M Univ., College Station, TX, [3]North Carolina State Univ., Raleigh, NC

3:00 **1332** Detection and monitoring of bed bugs. **Rick Cooper** (rcooper@sebs.rutgers.edu), Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

3:15 **1333** Endosymbiotic bacteria in the bed bug. **Mark Goodman** (mark.goodman@varmentguard.com), Varment Guard Environmental Services Inc, Columbus, OH

3:30 **Break**

3:45 **1334** Laboratory maintenance of bed bugs. **Mark F. Feldlaufer** (mark.feldlaufer@ars.usda.gov), USDA - ARS, Beltsville, MD

4:00 **1335** Bed bugs: Non-chemical controls become mainstream. **Stephen Kells** (kells002@umn.edu), Univ. of Minnesota, St. Paul, MN

4:15 **1336** Insecticide resistance in bed bugs. **Alvaro Romero** (aromero2@nmsu.edu), New Mexico State Univ., Las Cruces, NM

4:30 **1337** Factors influencing insecticide efficacy tests against bed bugs in the laboratory. **Chow-Yang Lee** (chowyang@usm.my)[1], Stephen Doggett[2] and Dini Miller[3], [1]Univ. Sains Malaysia, Penang, Malaysia, [2]NSW Health Pathology, Westmead, Australia, [3]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

4:45 **1338** Bed bug control in low-income housing. **Changlu Wang** (cwang@aesop.rutgers.edu) and Richard Cooper, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

5:00 **1339** Managing the risk of bed bugs in the hospitality industry. **David Cain** (dcain@bed-bugs.co.uk), Bed Bugs Limited, London, United Kingdom

5:15 **1340** Evolving standard of care in bed bug management and control. **Jeff Lipman** (lipmanlawfirm@aol.com), Lipman Law Firm, Des Moines, IA

5:30 **1341** On being an expert witness and observances of bed bugs in the real world. **Paul Bello** (paul.bello@att.net), PJB Pest Management Consulting LLC, Alpharetta, GA

MUVE Section Symposium: Resurgence of Black Flies (Diptera: Simuliidae) in the Academic and Public Arenas

Meeting Room 705 (Convention Center)

Moderators and Organizers: Rebecca Wilson[1] and Tina Nations[2], [1]Univ. of Maryland, College Park, MD, [2]Mississippi State Univ., Mississippi State, MS

1:30 **Introductory Remarks**

1:40 **1342** Black fly colonization and its contribution to larvicidal efficacy. **Elmer Gray** (ewgray@uga.edu) and Raymond Noblet, Univ. of Georgia, Athens, GA

1:55 **1343** Black fly abatement in the Humboldt River, northern Nevada, during 2017, a high water year. **Robin Gray** (sevenvalleysent@gmail.com), Seven Valleys LLC, Winnemucca, NV

2:10 **1344** Winter treatment of black flies (*Simulium vittatum*) in Twin Falls, Idaho. **Kirk Tubbs** (tfcpad@qwestoffice.net), Twin Falls County Pest Abatement District, Twin Falls, ID

2:25 **1345** A gene expression system for the *Simulium vittatum* complex (Diptera: Simuliidae). **Charles Brockhouse** (charlesbrockhouse@creighton.edu)[1] and Alexie Papanicolaou[2], [1]Creighton Univ., Omaha, NE, [2]Hawkesbury Institute for the Environment, Richmond, Australia

2:40 **1346** The black flies of central Idaho with emphasis on the *Simulium arcticum* group. **Gerald Shields** (gshields@carroll.edu), Carroll College, Helena, MT

2:55 **1347** Digging the dirt on fossil Simuliidae. **Doug Craig** (dcraig@ualberta.ca), Univ. of Alberta, Edmonton, AB, Canada

3:10 **Break**

3:25 **1348** How many gnats are too many? Resident concerns and black fly (Diptera: Simuliidae) abundance vary along a spatial gradient. **Rebecca Wilson** (rcwilson@umd.edu) and William O. Lamp, Univ. of Maryland, College Park, MD

3:40 **1349** Economic, human and animal health impacts of black flies (Diptera: Simuliidae) in Mississippi. **Tina Nations** (tina.nations@msdh.ms.gov)[1], Wendy Varnado[1], Audrey Harrison[2] and Jerome Goddard[3], [1]Mississippi Dept. of Health, Jackson, MS, [2]U.S. Waterways Experiment Station, Vicksburg, MS, [3]Mississippi State Univ., Mississippi State, MS

3:55 **1350** Managing the Pennsylvania black fly suppression program's rising costs: Tactics and impacts. **Douglas Orr** (doorr@pa.gov), Pennsylvania Dept. of Environmental Protection, Harrisburg, PA

4:10 **1351** Species extinction or species management: Black flies in the Galapagos Islands. **Peter H. Adler** (padler@clemson.edu)[1], Charles Brockhouse[2] and John W. McCreadie[3], [1]Clemson Univ., Clemson, SC, [2]Creighton Univ., Omaha, NE, [3]Univ. of South Alabama, Mobile, AL

4:25 **Panel Discussion**

PBT Section Symposium: Fruit Flies: From Model to Management

Meeting Room 711 (Convention Center)

Moderators and Organizers: Dong Cha[1] and Peter Witzgall[2], [1]USDA - ARS, Hilo, HI, [2]Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

1:30 **1352** Fruit odors and host race formation in populations of *Rhagoletis* fruit flies. **Dong H. Cha** (dong.cha@ars.usda.gov)[1], Sheina Sim[1], Thomas Powell[2], Wee Yee[3], Jeffrey Feder[4] and Charles E. Linn[5], [1]USDA - ARS, Hilo, HI, [2]State Univ. of New York, Binghamton, NY, [3]USDA - ARS, Wapato, WA, [4]Univ. of Notre Dame, Notre Dame, IN, [5]Cornell Univ., Geneva, NY

1:45 **1353** The blending of theory, facts, and feelings to develop a chemical lure for spotted wing drosophila. **Peter J. Landolt** (peter.landolt@ars.usda.gov)[1] and Dong H. Cha[2], [1]USDA - ARS, Wapato, WA, [2]USDA - ARS, Hilo, HI

2:00 **1354** Progress on the discovery and use of attractants and repellents for managing *Drosophila suzukii*. **Gregory Loeb** (gme1@cornell.edu)[1], Anna Wallingford[1] and Dong H. Cha[2], [1]Cornell Univ., Geneva, NY, [2]USDA - ARS, Hilo, HI

2:15 **1355** Testing novel attractants for *Drosophila suzukii*. **Cesar Rodriguez-Saona** (crodriguez@rce.rutgers.edu)[1], Johnattan Hernández-Cumplido[1], Hannah Burrack[2], Frank Drummond[3], Larry Gut[4], Rufus Isaacs[4], Gregory Loeb[5], Anne Nielsen[6], Zainulabeuddin Syed[7], Kyoo Park[8], Vaughn Walton[8] and Aijun Zhang[9], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]North Carolina State Univ., Raleigh, NC, [3]Univ. of Maine, Orono, ME, [4]Michigan State Univ., East Lansing, MI, [5]Cornell Univ., Geneva, NY, [6]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ, [7]Univ. of Notre Dame, Notre Dame, IN, [8]Oregon State Univ., Corvallis, OR, [9]USDA - ARS, Beltsville, MD

SD1356 Isolating spermathecae and determining mating status of *Drosophila suzukii*: A protocol for tissue dissection and its applications. **Alina Avanesyan** (alina.avanesyan@gmail.com)[1], Benjamin Jaffe[2] and Christelle Guédot[2], [1]Grand View Univ., Des Moines, IA, [2]Univ. of Wisconsin, Madison, WI

SD1357 Potential use of a fragrance, methyl benzoate, as pesticide for crop protection in sustainable agriculture. **Yan Feng** (yan.feng@ars.usda.gov) and Aijun Zhang, USDA - ARS, Beltsville, MD

SD1358 Nutrient profiles and survival of overwintering spotted-wing drosophila, *Drosophila suzukii* in northern United States. **Dalila Rendon** (dalila.rendon@oregonstate.edu)[1], Anna Wallingford[2], Elissa S. Ballman[3], Vaughn Walton[1] and Jana Lee[4], [1]Oregon State Univ., Corvallis, OR, [2]Cornell Univ., Geneva, NY, [3]Univ. of Maine, Orono, ME, [4]USDA - ARS, Corvallis, OR

SD1359 Investigation of genetic diversity in mtDNA (COI-COII) region of *Ceratitis capitata* Wiedmann (Diptera: Tephritidae) in the eastern Mediterranean region of Turkey. Adnan Tusun[1], Jim Smith[2] and **Serdar Satar** (hserhat@cu.edu.tr), [1]Çukurova Univ., Adana, Turkey, [2]Michigan State Univ., East Lansing, MI

2:30 **Break and Poster Session**

3:00 **1360** Field evaluation of novel male annihilation dispensers for management of fruit flies (Diptera: Tephritidae) in an integrated pest management system in Hawai'i. **Roger Vargas** (roger.vargas@ars.usda.gov)[1], Steven Souder[1] and Bruce Mackey[2], [1]USDA - ARS, Hilo, HI, [2]USDA - ARS, Albany, CA

3:15 **1361** Presentation withdrawn

3:30 **1362** Attract-and-kill systems for female fruit flies (Tephritidae). **Jaime Pinero** (pineroj@lincolnu.edu)[1], Steven Souder[2] and Roger Vargas[2], [1]Lincoln Univ., Jefferson City, MO, [2]USDA - ARS, Hilo, HI

3:45 **1363** Revisiting essential oils as sources of kairomones for tephritid fruit flies. **Nancy D. Epsky** (nancy.epsky@ars.usda.gov)[1], Nurhayat Tabanca[1] and Jerome Niogret[2], [1]USDA - ARS, Miami, FL, [2]Niogret Ecology Consulting LLC, Miami, FL

4:00 **Break**

4:15 **1364** Yeast volatiles influence attraction of the invasive fruit pest, *Drosophila suzukii* to food and oviposition sites. **Joelle Lemmen-Lechelt** (joelle.kristin.lechelt@slu.se)[1], Amrita Chakraborty[1], Boyd Mori[2], Peter Witzgall[1], Paul Becher[1] and Teun Dekker[1], [1]Swedish Univ. of Agricultural Sciences, Alnarp, Sweden, [2]Agriculture and Agri-Food Canada, Saskatoon, SK, Canada

4:30 **1365** How tephritid fruit fly genomics can be applied to chemical ecology. **Scott Geib** (scott.geib@ars.usda.gov), Sheina Sim and Julian Dupuis, USDA - ARS, Hilo, HI

4:45 **1366** Flipping the switch on host preference in tephritid fruit flies. **Shannon Olsson** (shannon@ncbs.res.in)[1], Cheyenne Tait[2], Hinal Kharva[1], Pavan Kaushik[1], Daniel Kritsch[3] and Jeffrey Feder[2], [1]National Centre for Biological Sciences, Bangalore, India, [2]Univ. of Notre Dame, Notre Dame, IN, [3]Max Planck Institute for Chemical Ecology, Jena, Germany

5:00 **SP1367** Translating olfaction into attraction. **Teun Dekker** (teun.dekker@slu.se), Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

5:10 **1368** The *Drosophila melanogaster* female pheromone is encoded together with food odor and mediates species-specific attraction. **Peter Witzgall** (peter.witzgall@ice3.se), Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

PBT Section Symposium: New Directions in Evaluating Insecticidal Proteins for Safety

This symposium is proudly sponsored by

Science For A Better Life

Meeting Room 603 (Convention Center)

Moderators and Organizers: William Moar[1] and Kenneth Narva[2], [1]Monsanto Company, St. Louis, MO, [2]Dow AgroSciences, Indianapolis, IN

1:30 **1369** Bioinformatic evaluation of insect control proteins to support GMO product safety assessments. **Andre Silvanovich** (andre.silvanovich@monsanto.com), Colton Kessenich, Adam Evans and William Moar, Monsanto Company, St. Louis, MO

2:00 **1370** Regulatory perspectives of using bioinformatics for prediction of insecticidal-protein safety. **Ping Song** (psong@dow.com) and Rod A. Herman, Dow AgroSciences, Indianapolis, IN

2:15 **1371** Improved protein safety profile by bioinformatics analysis and protein engineering. **Brad Poland** (brad.poland@pioneer.com)[1], Jimei Wang[2], Chad Wolfe[2], Andre Abad[2] and Lu Liu[3], [1]DuPont Pioneer, Johnston, IA, [2]Pioneer Hi-Bred International, Inc, Johnston, IA, [3]DuPont Pioneer, Hayward, CA

2:30 **1372** The role of protein domains and other key aspects of protein biology in evaluating the toxicity of new proteins. **Scott McClain** (scott.mcclain@syngenta.com), Syngenta Crop Protection, Research Triangle Park, NC

2:45 **1373** Bioinformatics-based analysis for insecticidal protein safety assessments. **Shravan Sukumar** (ssukumar@dow.com), Dow AgroSciences, Indianapolis, IN

3:00 **1374** The toxicity of epsilon toxin in ruminants. **Francisco Uzal** (fauzal@ucdavis.edu), Univ. of California, San Bernardino, CA

3:15 **1375** Identifying a receptor-binding domain in the *Clostridium perfringens* epsilon toxin. **Mark McClain** (mark.s.mcclain@vanderbilt.edu), Vanderbilt Univ. Medical Center, Nashville, TN

3:30 **Break**

3:45 **1376** Evolutionary conservation, diversity, and specificity of beta pore-forming proteins in foods. **Adam Evans** (adam.evans@monsanto.com), Monsanto Company, St. Louis, MO

4:00 **1377** Structure-function characterization of the novel coleopteran-toxic protein isolated from *Chromobacterium piscinae* sp. **Jelena Zaitseva** (jelena.zaitseva@bayer.com)[1], Daniel Vaknin[1], Christian Krebs[2], Deepa Balasubramanian[1] and Joerg Freigang[2], [1]Bayer CropScience, Morrisville, NC, [2]Bayer AG, Monheim, Germany

4:15 **1378** Using structural similarity to predict mode of action – A case study. **Nasser Yalpani** (nasser.yalpani@pioneer.com)[1], Rongjin Guan[2], Brad Poland[1], Timothy M. Nowatzki[1], Claudia Pérez-Ortega[1], Amit Sethi[1], Jian-Zhou Zhao[1] and Lu Liu[3], [1]DuPont Pioneer, Johnston, IA, [2]Nexomics Biosciences, Inc., Bordentown, NJ, [3]DuPont Pioneer, Hayward, CA

4:30 **1379** Case study: Providing context for *Bacillus thuringiensis* non-3 domain protein structure in safety assessments. **Kenneth Narva** (knarva@dow.com), Shravan Sukumar and Rod A. Herman, Dow AgroSciences, Indianapolis, IN

4:45 **1380** Environmental risk assessment for modified Cry51Aa2 protein as expressed in MON 88702 cotton with targeted activity against sucking insect pests in cotton. **Aqeel Ahmad** (aqeel.ahmad@monsanto.com), Peter Asiimwe, Christopher Brown, Pamela Bachman, Jennifer Fridley, Peter Jensen, Steven Levine, Jianguo Tan, Joshua Uffman and Todd Werk, Monsanto Company, St. Louis, MO

5:00 **1381** Evaluating new insecticidal proteins for safety: A regulatory perspective. **Andrea Hitchon** (andrea.hitchon@inspection.gc.ca), Agnes Lichota and Sarah G. Davis, Canadian Food Inspection Agency, Ottawa, ON, Canada

5:15 **Discussion**

PBT Section Symposium: The Peritrophic Matrix: From Past to Future

Meeting Room 301 (Convention Center)

Moderators and Organizers: Umut Toprak[1] and Ping Wang[2], [1]Univ. of Ankara, Ankara, Turkey, [2]Cornell Univ., Geneva, NY

1:30 **Introductory Remarks**

1:35 **1382** The peritrophic matrix. **Mike Lehane** (mike.lehane@lstmed.ac.uk), Liverpool School of Tropical Medicine, Liverpool, United Kingdom

1:50 **1383** Peritrophic membrane structural proteins, their genes and expression in *Trichoplusia ni*. **Ping Wang** (pingwang@cornell.edu)[1], Lihua Huang[2], Wenbo Chen[3] and Zhangjun Fei[4], [1]Cornell Univ., Geneva, NY, [2]South China Normal Univ., Guangzhou, China, [3]Boyce Thompson Institute for Plant Research, Ithaca, NY, [4]Cornell Univ., Ithaca, NY

2:05 **1384** Insight into the structure and formation of the lepidopteran peritrophic matrix based on studies of the bertha armyworm (*Mamestra configurata*). **Dwayne Hegedus** (dwayne.hegedus@agr.gc.ca)[1], Umut Toprak[1,2], Martin Erlandson[1] and Cedric Gillott[3], [1]Agriculture and Agri-Food Canada, Saskatoon, SK, Canada, [2]Univ. of Ankara, Ankara, Turkey, [3]Univ. of Saskatchewan, Saskatoon, SK, Canada

2:20 **1385** The molecular architecture of *Leptinotarsa decemlineata* peritrophic matrix: Implication of the first model in a beetle system. Emre Caner[1], **Umut Toprak** (utoprak@agri.ankara.edu.tr)[1], Serife Bayram[1], Dwayne Hegedus[2], Doug Baldwin[2], Cathy Coutu[2], Martin Erlandson[2] and David Heckel[3], [1]Univ. of Ankara, Ankara, Turkey, [2]Agriculture and Agri-Food Canada, Saskatoon, SK, Canada, [3]Max Planck Institute for Chemical Ecology, Jena, Germany

2:35 **1386** Peritrophic membrane genes from *Diabrotica virgifera virgifera* and their application to pest management. **Newton Carneiro** (newton.carneiro@embrapa.br)[1], Haichuan Wang[2], Ana Vélez[2] and Blair Siegfried[3], [1]Embrapa Milho e Sorgo, Sete Lagoas, Brazil, [2]Univ. of Nebraska, Lincoln, NE, [3]Univ. of Florida, Gainesville, FL

2:50 **1387** The termite peritrophic matrix: Potential roles in toxin protection, digestion and symbiosis. **Michael Scharf** (mscharf@purdue.edu)[1] and Andres Sandoval-Mojica, [1]Purdue Univ., West Lafayette, IN, [2]Univ. of Florida, Lake Alfred, FL

3:05 **1388** The peritrophic matrix of bees: Origin, permeability and perspectives. **José Eduardo Serrão** (jeserrao@ufv.br), Univ. Federal de Viçosa, Viçosa, Brazil

3:20 **Break**

3:35 **1389** Study of peritrophic membrane proteins from *Spodoptera exigua*. **Wei Guo** (guowei@hebau.edu.cn) and Dan Zhao, Beijing Univ. of Agriculture, Beijing, China

3:50 **1390** Proper chitin content in peritrophic matrix is critically important to insect growth and development. **Kun Yan Zhu** (kzhu@ksu.edu), Kansas State Univ., Manhattan, KS

4:05 **1391** Life without a peritrophic matrix: Effect of eliminating the PM in *Drosophila melanogaster*. **Edward Blumenthal** (edward.blumenthal@marquette.edu) and Sean Conway, Marquette Univ., Milwaukee, WI

4:20 **1392** Transglutaminase-catalyzed crosslinking of peritrophic matrix proteins maintains the gut epithelial immunity in *Drosophila*. **Toshio Shibata** (t_shibata@kyudai.jp), Kouki Maki, Takumi Fujikawa and Shun-ichiro Kawabata, Kyushu Univ., Fukuoka, Japan

4:35 **1393** Irritable bowel disease in caterpillars redux. **Dawn Luthe** (dsl14@psu.edu), Pennsylvania State Univ., University Park, PA

4:50 **1394** Penetration through the peritrophic matrix is a key to lectin toxicity against *Tribolium castaneum*. Tomasz Walski, Els Van Damme and **Guy Smagghe** (guy.smagghe@ugent.be), Ghent Univ., Ghent, Belgium

5:05 **Panel Discussion**

5:25 **Concluding Remarks**

P-IE Section Symposium: Igniting Next Generation Science on Habitat and Landscape Management to Enhance Pest Suppression and Pollination

Meeting Room 710/712 (Convention Center)

Moderators and Organizers: Douglas A. Landis[1], Claudio Gratton[2], Katja Poveda[3], Felix J. J. A. Bianchi[4] and Mary Gardiner[5], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Wisconsin, Madison, WI, [3]Cornell Univ., Ithaca, NY, [4]Wageningen Univ., Wageningen, Netherlands, [5]The Ohio State Univ., Columbus, OH

1:30 **1395** Using crop phylogenies with landscape maps to define phyloscapes: A test of the phylogenetic resource concentration hypothesis. **David Gonthier** (gonthierd@berkeley.edu) and Amber Sciligo, Univ. of California, Berkeley, CA

1:45 **1396** Role of HIPV's on enhancing biological control at multiple spatial scales. Yavanna Aartsma, Wopke van der Werf, Marcel Dicke, Erik Poelman and **Felix J. J. A. Bianchi** (felix.bianchi@wur.nl), Wageningen Univ., Wageningen, Netherlands

2:00 **1397** Effect of landscape simplification on the effectiveness of local management practices in delivering ecosystem services mediated by arthropods. **Katja Poveda** (kap235@cornell.edu), Heather Grab and Ricardo Perez-Alvarez, Cornell Univ., Ithaca, NY

2:15 **1398** Diversifying cropping systems to disrupt pests and benefit natural enemies in agricultural landscapes. **Tatyana Rand** (tatyana.rand@ars.usda.gov), USDA - ARS, Sidney, MT

2:30 **1399** Within crop effects of natural enemy diversity on pest suppression. **William Snyder** (wesnyder@wsu.edu), Washington State Univ., Pullman, WA

2:45 **1400** Role of landscape configuration and change across time on pest suppression. Nancy Schellhorn[1] and **Vesna Gagic** (vesna.gagic@csiro.au)[2], [1]CSIRO, Dutton Park, Australia, [2]CSIRO, Brisbane, Australia

3:00 **1401** Landscape-scale resource continuity for enhanced biological control. **Brian Spiesman** (bspiesman@wisc.edu) and Claudio Gratton, Univ. of Wisconsin, Madison, WI

3:15 **1402** Managing landscapes for pollinators and natural enemies: Theory, applications and new frontiers. **David Kleijn** (david.kleijn@wur.nl), Wageningen Univ., Wageningen, Netherlands

P-IE Section Symposium: Igniting the Future of Insect Migration Research

Meeting Room 402 (Convention Center)

Moderators and Organizers: Jennifer Krauel[1], Tyler Flockhart[2] and Aislinn Pearson[3], [1]Univ. of Tennessee, Knoxville, TN, [2]Univ. of Guelph, Guelph, ON, Canada, [3]Rothamsted Research, Harpenden, United Kingdom

1:30 **1403** Insects on the move: The diversity, characteristics, and ecological implications of migratory insect. **Dara Satterfield** (satterfieldd@si.edu)[1], Scott Sillett[2], Jason Chapman[3], Sonia Altizer[4] and Peter P. Marra[2], [1]Smithsonian Migratory Bird Center, Washington, DC, [2]Smithsonian Conservation Biology Institute, Washington, DC, [3]Rothamsted Research, Harpenden, United Kingdom, [4]Univ. of Georgia, Athens, GA

1:45 **1404** How chemical ecology can provide insight into insect migration. **Jeremy N. McNeil** (jmcneil2@uwo.ca), Western Univ., London, ON, Canada

2:00 **1405** Energetics of insect migration. **Kristjan Niitepõld** (kristjan.niitepold@helsinki.fi), Univ. of Helsinki, Helsinki, Finland

2:15 **1406** The marmalade hoverfly as a model for insect migration. **Karl Wotton** (k.r.wotton@exeter.ac.uk), Univ. of Exeter, Cornwall, United Kingdom

2:30 **1407** A multi-disciplinary approach towards unravelling modern and historical patterns of insect migration in Europe. **Myles Menz** (myles.menz@iee.unibe.ch) and Marco Thoma, Univ. of Bern, Bern, Switzerland

2:45 **1408** Immigration of the painted lady butterfly into Europe is predicted by rainfall and vegetation growth in North Africa. **Constanti Stefanescu** (canliro@gmail.com)[1], Gao Hu[2], Tom Oliver[3] and Jason Chapman[4], [1]Natural History Museum, Granollers, Spain, [2]Nanjing Agricultural Univ., Nanjing, China, [3]Univ. of Reading, Reading, United Kingdom, [4]Univ. of Exeter, Penryn, United Kingdom

3:00 **1409** Tracking painted lady migration movements using hydrogen isotopes. **David Soto** (david.soto@kuleuven.be)[1] and Constantí Stefanescu[2], [1]Katholieke Univ. Leuven, Leuven, Belgium, [2]Natural History Museum, Granollers, Spain

3:15 **Break**

3:30 **1410** Classification of migrating insects by weather radar. **John Westbrook** (john.westbrook@ars.usda.gov), USDA - ARS, College Station, TX

3:45 **1411** Using predator-prey interaction to high-altitude insect migration. **Jennifer Krauel** (jkrauel@utk.edu)[1], Veronica Brown[1], John Westbrook[2] and Gary McCracken[1], [1]Univ. of Tennessee, Knoxville, TN, [2]USDA - ARS, College Station, TX

4:00 **1412** Integrating migration and population dynamics for the conservation and management of migratory insects. **Tyler Flockhart** (dflockha@uoguelph.ca), Univ. of Guelph, Guelph, ON, Canada

4:15 **1413** Presentation withdrawn

4:30 **1414** Moving forward in insect migration: How do we get at the big picture? **Aislinn Pearson** (aislinn.pearson@rothamsted.ac.uk)[1], Jennifer Krauel[2] and Jason Chapman[1], [1]Rothamsted Research, Harpenden, United Kingdom, [2]Univ. of Tennessee, Knoxville, TN

4:45 **Panel Discussion**

5:15 **Reception**

P-IE Section Symposium: Igniting, Inspiring, and Influencing the Public Mind: Roles in Educating the Public on Biotechnology

Meeting Room 404 (Convention Center)

Moderators and Organizers: Marc Fisher and Boris Castro, Dow AgroSciences, Indianapolis, IN

1:30 **Introductory Remarks**

1:40 **1415** Agricultural research and extension: Is the use of science sufficient to influence public perception of biotechnology? **B. Roger Leonard** (rleonard@agcenter.lsu.edu), Louisiana State Univ., Baton Rouge, LA

1:55 **1416** What honeybees taught me about journalism. **Alan Bjerga** (abjerga@bloomberg.net), Bloomberg News, New York, NY

2:10 **1417** Implementation of the bioengineered food disclosure law. **Andrea Huberty** (andrea.f.huberty@ams.usda.gov), USDA - AMS, Washington, DC

2:25 **1418** Non-profits and biotechnology: The role and impact of non-profits on public perception of biotechnology. Adrianne Massey and **Clint Nesbitt** (cnesbitt@bio.org), Biotechnology Industry Organization, Washington, DC

2:40 **Break**

2:55 **1419** Technology providers' broad outreach and education about biotechnology and its products. **Nicholas Storer** (nstorer@dow.com), Dow AgroSciences, Indianapolis, IN

3:10 **1420** How to correct biotechnology perception? Ethics instead of information. **Kevin Folta** (kfolta@ufl.edu), Univ. of Florida, Gainesville, FL

3:25 **1421** Meeting the growing consumer demand for product information. **Roger Lowe** (rlowe@gmaonline.org), Grocery Manufacturers Association, Washington, DC

3:40 **1422** Current corn grower perceptions and awareness on insect resistance. **Nathan Fields** (fields@ncga.com), National Corn Growers Association, Chesterfield, IL

3:55 **Panel Discussion**

P-IE Section Symposium: Interactions of Bark and Ambrosia Beetles with their Fungal Symbionts and Naive Hosts: Exploring Biological, Ecological, and Physiological Vulnerabilities

Meeting Room 702 (Convention Center)

Moderators and Organizers: Christopher Ranger[1] and Matthew Ginzel[2], [1]USDA - ARS, Wooster, OH, [2]Purdue Univ., West Lafayette, IN

1:30 **1423** Understanding factors affecting landscape invasibility for improving early-detection of exotic bark and ambrosia beetles. **Davide Rassati** (davide.rassati@unipd.it)[1], William Monahan[2], Vanessa Lopez[2], Robert Rabaglia[3], Frank Sapio[2], Frank Krist[2] and Lorenzo Marini[1], [1]Univ. of Padova, Padova, Italy, [2]USDA - Forest Service, Fort Collins, CO, [3]USDA - Forest Service, Washington, DC

1:45 **1424** Seasonal variations and resource utilization patterns of ambrosia beetles on *Fagus crenata*. **Hiroaki Iidzuka** (iizuka.hiroaki.82u@st.kyoto-u.ac.jp)[1], Hideaki Goto[2], Michimasa Yamasaki[1] and Naoya Osawa[1], [1]Kyoto Univ., Kyoto, Japan, [2]Kyushu Research Center, Kumamoto, Japan

2:00 **1425** Coffee berry borer management, *Hypothenemus hampei*, in Hawai'i and Puerto Rico. **Mark Wright** (markwrig@hawaii.edu)[1], Ishakh Thodi[2], Sayaka Aoki[1], Jeffrey Ferrer[1], Fernando E. Vega[3] and Elsie Greco[1], [1]Univ. of Hawai'i, Honolulu, HI, [2]Univ. of Hawai'i, Hilo, HI, [3]USDA - ARS, Beltsville, MD

2:15 **1426** Host range, distribution, and biocontrol of invasive shot hole borer-fusarium dieback in California. **Akif Eskalen** (akif.eskalen@ucr.edu)[1], Shannon Lynch[1], Joey Mayorquin[1], F. Na[1], Paul F. Rugman-Jones[1], Richard Stouthamer[1] and T. Thibault[2], [1]Univ. of California, Riverside, CA, [2]Huntington Library, San Marino, CA

2:30 **1427** Management strategies for bark beetles in western coniferous forests: The old and the new. **Christopher J. Fettig** (cfettig@fs.fed.us)[1], Clifford Bradley[2], Joel Egan[3], Gabriel Foote[4], Don Grosman[5], Richard Hofstetter[6], Agenor Mafra-Neto[7], Steve Munson[8], Robert A. Progar[9] and Brytten E. Steed[3], [1]USDA - Forest Service, Davis, CA, [2]Montana BioAgriculture Inc, Missoula, MT, [3]USDA - Forest Service, Missoula, MT, [4]Oregon State Univ., Corvallis, OR, [5]Arborjet, Inc, Woburn, MA, [6]Northern Arizona Univ., Flagstaff, AZ, [7]ISCA Technologies, Inc, Riverside, CA, [8]USDA - Forest Service, Ogden, UT, [9]USDA - Forest Service, La Grande, OR

2:45 **1428** Chemical ecology and serendipity: Developing attractants for Florida ambrosia beetle pests. **David Owens** (owensd119@ufl.edu)[1], Paul E. Kendra[2], Wayne S. Montgomery[2], Teresa Narvaez[2], Daniel Carrillo[3] and Nurhayat Tabanca[2], [1]Univ. of Florida, Belle Glade, FL, [2]USDA - ARS, Miami, FL, [3]Univ. of Florida, Homestead, FL

SD1429 Improving the integrated pest management for coffee berry borer *Hypothenemus hampei* (Ferrari) in commercial coffee plantations in Hawai'i. **Luis Aristizabal** (laristizabal721@gmail.com)[1], Suzanne Shriner[1], Robert Hollingsworth[2] and Steven Arthurs[3], [1]Synergistic Hawai'i Agriculture Council, Hilo, HI, [2]USDA - ARS, Hilo, HI, [3]Texas A&M Univ., College Station, TX

SD1430 Long-lasting protection: Preventing ambrosia beetle attacks in ornamental nurseries using insecticidal netting. **Chris Werle** (chris.werle@ars.usda.gov)[1], Blair Sampson[1], Christopher Ranger[2], Peter B. Schultz[3], Jason B. Oliver[4] and Karla Addesso[4], [1]USDA - ARS, Poplarville, MS, [2]USDA - ARS, Wooster, OH, [3]Virginia Polytechnic Institute and State Univ., Virginia Beach, VA, [4]Tennessee State Univ., McMinnville, TN

SD1431 3-methylcyclohex-2-en-1-one: Development of a novel formulation for tree protection and assessment of ecological risks to forest pollinators. Gabriel Foote[1], **Christopher J. Fettig** (cfettig@fs.fed.us)[2], Darrell W. Ross[1], Justin Runyon[3] and Agenor Mafra-Neto[4], [1]Oregon State Univ., Corvallis, OR, [2]USDA - Forest Service, Davis, CA, [3]USDA - Forest Service, Bozeman, MT, [4]ISCA Technologies, Inc, Riverside, CA

SD1432 Systemic fungicide treatment suppresses ambrosia beetle attacks and *Phytophthora cinnamomi* root rot infection during a simulated flooding event. **Karla Addesso** (kaddesso@tnstate.edu), Fulya Baysal-Gurel, Jason B. Oliver and Paul O'Neal, Tennessee State Univ., McMinnville, TN

SD1433 Manipulation of pest ambrosia beetles with a 'push-pull-block' approach – Can it work to prevent attacks on nursery tree crops? **Jason B. Oliver** (joliver@tnstate.edu)[1], Karla Addesso[1], Christopher Ranger[2], Michael Reding[2], Peter B. Schultz[3], Christopher Werle[4], Matthew Brown[5], Alicia Bray[6], Nadeer Youssef[1] and Paul O'Neal[1], [1]Tennessee State Univ., McMinnville, TN, [2]USDA - ARS, Wooster, OH, [3]Virginia Polytechnic Institute and State Univ., Virginia Beach, VA, [4]USDA - ARS, Poplarville, MS, [5]Tennessee State Univ., Nashville, TN, [6]Central Connecticut State Univ., New Britain, CT

SD1434 Phenology of invasive ambrosia beetles associated to nursery crops in western Kentucky. Zenaida Viloria, Winston Dunwell, Ginny Travis and **Raul T. Villanueva** (raul.villanueva@uky.edu), Univ. of Kentucky, Princeton, KY

SD1435 Utilizing the alcohol dependence of ambrosia beetles to further pest management strategies in nurseries. **Peter B. Schultz** (schultzp@vt.edu)[1], Christopher Ranger[2], Michael Reding[2], Jason B. Oliver[3] and Christopher Werle[4], [1]Virginia Polytechnic Institute and State Univ., Virginia Beach, VA, [2]USDA - ARS, Wooster, OH, [3]Tennessee State Univ., McMinnville, TN, [4]USDA - ARS, Poplarville, MS

SD1436 Fungi associated with insect galleries and lesions in branches of TCD-impacted walnut and *Geosmithia* species diversity on field-collected beetles. **William Klingeman** (wklingem@utk.edu)[1], Karandeep Chahal[1], Romina Gazis[1], Steven Seybold[2], Andrew Graves[3], Mark T. Windham[1] and Denita Hadziabdic[1], [1]Univ. of Tennessee, Knoxville, TN, [2]USDA - Forest Service, Davis, CA, [3]USDA - Forest Service, Albuquerque, NM

SD1437 Ethanol-based attraction for intercepting ambrosia beetles emigrating into nurseries. **Michael Reding** (mike.reding@ars.usda.gov)[1], Christopher Ranger[1], Chris Werle[2], Blair Sampson[2], Jason B. Oliver[3] and Peter B. Schultz[4], [1]USDA - ARS, Wooster, OH, [2]USDA - ARS, Poplarville, MS, [3]Tennessee State Univ., McMinnville, TN, [4]Virginia Polytechnic Institute and State Univ., Virginia Beach, VA

SD1438 Effect of Beaumont-Fukunaga pruning system on the rate of infestation and spatial distribution of coffee berry borer (Coleoptera: Curculionidae) in Hawai'i Island. **Ishakh Pulakkatu-Thodi** (ishakpt@gmail.com), Rosemary Gutierrez and Mark Wright, Univ. of Hawai'i, Honolulu, HI

SD1439 Thousand cankers disease: Scolytine beetles and associated fungal pathogens recovered from symptomatic eastern black walnut (*Juglans nigra*). **Tyler Stewart** (stewar23@purdue.edu)[1], Margaret McDermott[2], Jennifer Juzwik[3] and Matthew Ginzel[1], [1]Purdue Univ., West Lafayette, IN, [2]Univ. of Minnesota, St. Paul, MN, [3]USDA - Forest Service, St. Paul, MN

SD1440 A two-component lure for better detection of pest *Euwallacea* nr. *fornicatus* in Florida avocado groves. **Paul E. Kendra** (paul.kendra@ars.usda.gov)[1], David Owens[1], Wayne S. Montgomery[1], Teresa Narvaez[1], Nurhayat Tabanca[1] and Daniel Carrillo[2], [1]USDA - ARS, Miami, FL, [2]Univ. of Florida, Homestead, FL

SD1441 Trapping methods for walnut twig beetle, *Pityophthorus juglandis*, during the height of population density in eastern Tennessee. **Alicia Bray** (brayalic@gmail.com)[1], Jason B. Oliver[2], William Klingeman[3] and Nadeer Youssef[2], [1]Central Connecticut State Univ., New Britain, CT, [2]Tennessee State Univ., McMinnville, TN, [3]Univ. of Tennessee, Knoxville, TN

3:00 **Break and Poster Session**

3:30 **1442** Behavioral responses of *Pityophthorus juglandis* (Coleoptera: Curculionidae: Scolytinae) to volatiles of black walnut and *Geosmithia morbida*, the causal agent of Thousand Cankers Disease. **Matthew Ginzel** (mginzel@purdue.edu)[1], Bridget Blood[1], Matthew A. Paschen[1], Denita Hadziabdic[2], Jennifer Juzwik[3], John J. Couture[1] and William Klingeman[2], [1]Purdue Univ., West Lafayette, IN, [2]Univ. of Tennessee, Knoxville, TN, [3]USDA - Forest Service, St. Paul, MN

3:45 **1443** The basis of ambrosia symbiosis: Bacterial control of asexual fruiting in *Raffaelea sulphurea*. **Pamela Baumann** (pamela.baumann@uni-jena.de) and Peter Biedermann, Max Planck Institute for Chemical Ecology, Jena, Germany

4:00 **1444** Embracing complexity to accelerate discovery in the fungal symbioses of bark and ambrosia beetles. **James Skelton** (skelto3@gmail.com)[1], Michelle Jusino[2], Paige Carlson[1], Katherine Smith[1], You Li[1], Craig Bateman[1], Mark Banik[1], Daniel Lindner[2], Jonathan Palmer[2], Pham Thai[3] and Jiri Hulcr[1], [1]Univ. of Florida, Gainesville, FL, [2]USDA - Forest Service, Madison, WI, [3]Vietnam Academy of Science and Technology, Ha Noi, Viet Nam

4:15 **1445** Vectors on the move: Population structure and genetic diversity of walnut twig beetle. Emel Oren[1], William Klingeman[1], Paris L. Lambdin[1], John Moulton[1], Jay Pscheidt[2], Whitney Cranshaw[3], Massimo Faccoli[4], Matthew Ginzel[5] and **Denita Hadziabdic** (dhadziab@utk.edu)[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Oregon State Univ., Corvallis, OR, [3]Colorado State Univ., Fort Collins, CO, [4]Univ. of Padova, Legnaro, Italy, [5]Purdue Univ., West Lafayette, IN

4:30 **1446** Exploiting beetle-fungus symbiosis to target insect pests: Case of the ambrosia beetles *Xylosandrus* spp. **Louela Castrillo** (lac48@cornell.edu), Michael Griggs and John Vandenberg, USDA - ARS, Ithaca, NY

4:45 **1447** Microbial symbionts at the interface: Chemical and biological warfare within trees. **Kier Klepzig** (kklepzig@fs.fed.us), USDA - Forest Service, Newton, GA

5:00 **1448** Benefit of host-tree chemistry on fungus farming by generalist ambrosia beetles. **Christopher Ranger** (christopher.ranger@ars.usda.gov)[1], Vipaporn Phuntumart[2], Peter Biedermann[3], Gayathri Beligala[2], Satyaki Ghosh[2], Jenny Barnett[1] and Michael Reding[1], [1]USDA - ARS, Wooster, OH, [2]Bowling Green State Univ., Bowling Green, OH, [3]Max Planck Institute for Chemical Ecology, Jena, Germany

SysEB Section Symposium: Big Data and Bugs: How Massively Collected Biodiversity Data Are Changing the Way We Do Insect Science

Meeting Room 607 (Convention Center)

Moderators and Organizers: Deborah Paul[1], Ana Dal Molin[2] and Pamela Soltis[3], [1]Integrated Digitized Biological Collections - iDigBio, Tallahassee, FL, [2]Univ. Federal do Paraná, Paraná, Brazil, [3]Integrated Digitized Biological Collections - iDigBio, Gainesville, FL

1:30 **Welcoming Remarks**

1:35 **1449** Using specimens and linked data in ecological and evolutionary research. **Pamela Soltis** (psoltis@flmnh.ufl.edu), Integrated Digitized Biological Collections - iDigBio, Gainesville, FL

1:50 **1450** Utilizing digitized specimen data to trace the history and predict the future for an economically important pest of commercial fruits. **Crystal Klem** (cklem@purdue.edu)[1], Jennifer Zaspel[1] and Alberto Zilli[2], [1]Purdue Univ., West Lafayette, IN, [2]The Natural History Museum, London, United Kingdom

2:05 **SP1451** Ecoinformatics and the curious case of katydids on California mandarins. **Bodil Cass** (bncass@ucdavis.edu)[1], Elizabeth Grafton-Cardwell[2] and Jay Rosenheim[1], [1]Univ. of California, Davis, CA, [2]Univ. of California, Riverside, CA

2:15 **1452** Collections data and citizen scientists shaping the conservation decision-making process for at-risk butterfly species. **Jaret Daniels** (jdaniels@flmnh.ufl.edu)[1] and Dean Jue[2], [1]Univ. of Florida, Gainesville, FL, [2]Florida Natural Areas Inventory, Tallahassee, FL

2:30 **SP1453** Real time massive online citizen science biodiversity programs: Lessons from butterflies. **Kathleen Prudic** (klprudic@email.arizona.edu)[1], Kent McFarland[2], Rebecca Hutchinson[3], Jeffrey Oliver[1], Jeremy Kerr[4], Maxim Larrivée[5] and Elizabeth C. Long[6], [1]Univ. of Arizona, Tucson, AZ, [2]Vermont Center for Ecostudies, Norwich, VT, [3]Oregon State Univ., Corvallis, OR, [4]Univ. of Ottawa, Ottawa, ON, Canada, [5]Montreal Insectarium Space for Life, Montreal, QC, Canada, [6]Mohonk Preserve, New Paltz, NY

2:40 **1454** Bringing the dead alive - The value of dead flies. **Erica McAlister** (e.mcalister@nhm.ac.uk), Natural History Museum, London, United Kingdom

2:55 **1455** From the tropics to the drawer and back: Digitized New World swallowtail butterfly specimens inform diversity patterns. **Hannah Owens** (howens@flmnh.ufl.edu) and Laura Brenskelle, Univ. of Florida, Gainesville, FL

SD1456 Low-cost genomic architecture as a species delimitation tool using rDNA fingerprints. **John Sproul** (johnssproul@gmail.com) and David Maddison, Oregon State Univ., Corvallis, OR

SD1457 Students discover: ANTS - Connecting science and education. **Daniela Sorger** (dmsorger@ncsu.edu)[1,2], Paige Derouin[3], Maggie McKinley[4], Michelle Hafey[5] and Rob R. Dunn[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina Museum of Natural Sciences, Raleigh, NC, [3]Wake Young Men's Leadership Academy, Raleigh, NC, [4]Burgaw Middle School, Burgaw, NC, [5]Penderlea School, Willard, NC

3:10 **Break and Poster Session**

3:25 **1458** From office wallpaper to research product: How digitization of the Field Museum's water beetles yields insights to their historical distributions in North America. **Crystal Maier** (crystal.maier@gmail.com), Field Museum of Natural History, Chicago, IL

3:40 **1459** Using nano-CT scanning to study novel ultrasound-producing structures across Lepidoptera. **David Plotkin** (dplotkin@ufl.edu)[1], Jesse R. Barber[2] and Akito Kawahara[1], [1]Univ. of Florida, Gainesville, FL, [2]Boise State Univ., Boise, ID

3:55 **SP1460** Progressing toward Odomatic: Automatic species identification of Odonata from *in situ* photographs. **William Kuhn** (will.kuhn@rutgers.edu)[1] and John C. Abbott[2], [1]National Science Foundation, Knoxville, TN, [2]Univ. of Alabama, Tuscaloosa, AL

4:05 **1461** Querying semantic phenotypes with transcribed specimen data. Matthew J. Yoder[1], **István Mikó** (istvan.miko@gmail.com)[2], Andrew Deans[2], James Balhoff[3] and Sergey Tarasov[4], [1]Univ. of Illinois, Champaign, IL, [2]Pennsylvania State Univ., University Park, PA, [3]Renaissance Computing Institute, Chapel Hill, NC, [4]National Institute for Mathematical and Biological Synthesis (NIMBioS), Knoxville, TN

4:20 **1462** Uses of the TaxOnline biocollections data network. **Luciane Marinoni** (lmarinoni@ufpr.br), Univ. Federal do Paraná, Curitiba, Brazil

4:35 **1463** Challenges and trends in really big insect collection datasets. **Katja C. Seltmann** (seltmann@ccber.ucsb.edu), Univ. of California, Santa Barbara, CA

4:50 **Discussion**

SysEB Section Symposium: Lighting the Candle: Innovative Approaches for Illuminating Earth's Biodiversity

Meeting Room 605 (Convention Center)

Moderators and Organizers: Robert R. Kula[1] and Michael Caterino[2], [1]USDA - ARS, Washington, DC, [2]Clemson Univ., Clemson, SC

1:30 **Introductory Remarks**

1:35 **1464** Bottlenecks and backlogs - Surveying braconid biodiversity from *Adelius* to *Zele*. **Robert R. Kula** (robert.kula@ars.usda.gov), USDA - ARS, Washington, DC

1:50 **1465** Seeing the forest and the trees – Arthropod inventories at multiple systematic levels. **Michael Caterino** (mcateri@clemson.edu), Clemson Univ., Clemson, SC

2:05 **1466** A multi-taxon cyberdiversity inventory of a small Caribbean island. **Jeremy Miller** (jeremy.miller@naturalis.nl)[1], Michael Stech[1], Tinde van Andel[1], John Smit[1], A.J. Winter[1], Ed Colijn[2], Roland Butot[1], Koos Biesmeijer[1], Hannah Madden[3] and Berry van der Hoorn[1], [1]Naturalis Biodiversity Center, Leiden, Netherlands, [2]European Invertebrate Survey, Leiden, Netherlands, [3]St. Eustatius National Parks, Gallows Bay, Bonaire, Sint Eustatius and Saba

2:20 **1467** Stop, don't throw that out! Assessing biodiversity of megadiverse, overlooked groups. **Ray Fisher** (jrfisher@uark.edu) and Ashley P. G. Dowling, Univ. of Arkansas, Fayetteville, AR

2:35 **1468** DNA barcode enabled ecological and taxonomic research and monitoring. **Scott Miller** (millers@si.edu)[1], Vojtech Novotny[2], Yves Basset[3], George Weiblen[4], Jeremy deWaard[5] and Paul Hebert[5], [1]Office of the Under Secretary for Science, Washington, DC, [2]Biological Centre ASCR, –eské Bud–jovice, Czech Republic, [3]Smithsonian Tropical Research Institute, Panama City, Panama, [4]Univ. of Minnesota, St. Paul, MN, [5]Univ. of Guelph, Guelph, ON, Canada

2:50 **1469** Mitochondrial metagenomics: A one stop shop for evolutionary biology, ecology and population genetics. **Alfried Vogler** (a.vogler@imperial.ac.uk)[1], Benjamin Linard[2] and Thomas Creedy[3], [1]The Natural History Museum, London, United Kingdom, [2]LIRMM - CNRS, Montpellier, France, [3]Imperial College of London, Ascot, United Kingdom

SD1470 The ground beetles of Plummers Island (Coleoptera: Carabidae): A follow up study* on the fauna in relation to size, habitat selection, vagility, seasonality, and extinction with emphasis on the relationship between climate change and population trends. **Charlotte Aldebron** (c.aldebron@gmail.com), Smithsonian Institution, Washington, DC

SD1471 Studies of parasitoid wasps of the family Braconidae in shortgrass prairie ecosystems. **Lawrence Haimowitz** (lhaimowi@uwyo.edu), Univ. of Wyoming, Laramie, WY

SD1472 A paleoenvironmental and taphonomic study of Late Pleistocene southern California based on a unique fossil insect assemblage from the Rancho La Brea Tar Pits. **Anna Holden** (aholden@amnh.org)[1] and John Southon[2], [1]American Museum of Natural History, New York, NY, [2]Univ. of California, Irvine, CA

SD1473 How well do we really know aphid-parasitoid wasp associations? **Abigail Martens** (abigail.martens@jacks.sdstate.edu)[1], Paul J. Johnson[1], Gary L. Miller[2] and Robert R. Kula[3], [1]South Dakota State Univ., Brookings, SD, [2]USDA - ARS, Beltsville, MD, [3]USDA - ARS, Washington, DC

SD1474 Molecular evaluation of tropical parasitoid diversity: A point against the anomalous diversity hypothesis. **Sarah Meierotto** (s.meierotto@uky.edu), Univ. of Kentucky, Lexington, KY

SD1475 Bee abundance and richness across forest canopy types in timber harvest areas. **Hannah Mullally** (hmullall@utk.edu) and Charles Kwit, Univ. of Tennessee, Knoxville, TN

SD1476 Cataloguing the "last biotic frontier": Winklers and Berleses. **Brittany Owens** (brittanyeowens@gmail.com) and Christopher E. Carlton, Louisiana State Univ., Baton Rouge, LA

SD1477 Exotic plants provide important forage for native bees in cities. **Scott Prajzner** (prajzner.1@osu.edu)[1], Frances S. Sivakoff[2] and Mary Gardiner[2], [1]The Ohio State Univ., Wooster, OH, [2]The Ohio State Univ., Columbus, OH

SD1478 Mapping terrestrial biodiversity across the planet: A progress report on the Global Malaise Program. **Kate Perez** (kperez@uoguelph.ca)[1], Jayme Sones[1], Jeremy deWaard[1], Scott Miller[2] and Paul Hebert[1], [1]Univ. of Guelph, Guelph, ON, Canada, [2]Office of the Under Secretary for Science, Washington, DC

3:05 **Poster Session and Break**

3:20 **1479** Insect diversity in the context of classical biocontrol of pests. **Kim Hoelmer** (kim.hoelmer@ars.usda.gov), USDA - ARS, Newark, DE

3:35 **1480** Parasitoid guilds of emerald ash borer in its native and invasive ranges: Diversity and potential for biocontrol. **Jian Duan** (jian.duan@ars.usda.gov)[1], Leah S. Bauer[2] and Xiao-Yi Wang[3], [1]USDA - ARS, Newark, DE, [2]USDA - Forest Service, Lansing, MI, [3]Chinese Academy of Forestry, Beijing, China

3:50 **1481** Life associated with agricultural drainage ditches: Linking biodiversity to ecosystem function. **William O. Lamp** (lamp@umd.edu) and Alan Leslie, Univ. of Maryland, College Park, MD

4:05 **1482** The living dead: Biodiversity of human remains in southeast Texas. **Sibyl Bucheli** (srb009@shsu.edu), Sam Houston State Univ., Huntsville, TX

4:20 **1483** Bringing inventory to the city: The BioSCAN project in Los Angeles. **Brian V. Brown** (bbrown@nhm.org) and Emily Hartop, Natural History Museum, Los Angeles, CA

4:35 **1484** Biodiversity without ever leaving the house: Common and rare arthropods found by sampling inside homes. **Matthew Bertone** (matt_bertone@ncsu.edu), North Carolina State Univ., Raleigh, NC

4:50 **Concluding Remarks**

Member Symposium: Advances in Arthropod Genomics

Meeting Room 502 (Convention Center)

Moderators and Organizers: Monica Munoz-Torres[1], Monica F. Poelchau[2] and Susan Brown[3], [1]Lawrence Berkeley National Laboratory, Berkeley, CA, [2]USDA - ARS, Beltsville, MD, [3]Kansas State Univ., Manhattan, KS

1:30 **Introductory Remarks**

1:35 **1485** Manual annotation of the major families of chemoreceptors and the odorant binding proteins in the genome of the German cockroach *Blattella germanica* reveals the largest known chemosensory repertoire for an arthropod. **Hugh M. Robertson** (hughrobe@uiuc.edu), Univ. of Illinois, Champaign, IL

1:50 **1486** Sequencing an arthropod genome using single molecule reads and long-range scaffolding technologies. **Surya Saha** (ss2489@cornell.edu)[1], Prashant Hosmani[2], Mirella Flores-Gonzalez[1], Wayne Hunter[3], Susan Brown[4] and Lukas Mueller[1], [1]Boyce Thompson Institute for Plant Research, Ithaca, NY, [2]Sol Genomics Network, Ithaca, NY, [3]USDA - ARS, Fort Pierce, FL, [4]Kansas State Univ., Manhattan, KS

2:05 **1487** Applying functional omics to understand *Drosophila*-gut microbes interactions. **Adam Wong** (adamcnwong@ufl.edu)[1] and Angela Douglas[2], [1]Univ. of Florida, Gainesville, FL, [2]Cornell Univ., Ithaca, NY

2:20 **1488** Building upon foundational genomic resources to improve the Sterile Insect Technique. **Sheina Sim** (sheina.sim@ars.usda.gov) and Scott Geib, USDA - ARS, Hilo, HI

2:35 **Break**

2:50 **1489** Is specialization driven by loss-of-function mutations? A comparison of chemoreceptor evolution in a generalist/specialist pair of pine sawflies **Kim Vertacnik** (kim.duong@uky.edu)[1] and Catherine Linnen[2], [1]Western Washington Univ., Bellingham, WA, [2]Univ. of Kentucky, Lexington, KY

3:05 **1490** Transcriptome profiling reveals heterogeneity of primary axis determinants in dipteran insects. **Urs Schmidt-Ott** (uschmid@uchicago.edu)[1], Jeff Klomp[2] and Yoseop Yoon[1], [1]Univ. of Chicago, Chicago, IL, [2]Univ. of Illinois, Chicago, IL

3:20 **1491** Applications and troubleshooting of whole genome bisulfite sequencing (WGBS) of symbiotic cells of the pea aphid. **Allison Hansen** (akh@illinois.edu), Univ. of Illinois, Champaign, IL

3:35 **1492** Processes and patterns of evolution in the oldest terrestrial arthropods on Earth. **Lauren Esposito** (lesposito@calacademy.org), California Academy of Sciences, San Francisco, CA

3:50 **1493** Honey bee hologenome and bee health. **Jay Evans** (evansj@ba.ars.usda.gov)[1], Anna Childers[1], Qiang Huang[1] and Ryan Schwarz[2], [1]USDA - ARS, Beltsville, MD, [2]Fort Lewis College, Durango, CO

4:05 **Break**

4:15 **SP1494** Sex-associated genes differ among *Aedes aegypti* subspecies. **Corey Campbell** (corey.campbell@colostate.edu)[1], Laura Dickson[1], Saul Lozano-Fuentes[2], Punita Juneja[3], Francis Jiggins[3], John-Paul Mutebi[2] and William Black[1], [1]Colorado State Univ., Fort Collins, CO, [2]Centers for Disease Control and Prevention, Fort Collins, CO, [3]Univ. of Cambridge, Cambridge, United Kingdom

4:25 **SP1495** Transposable element insertion preferences and gene ontology in i5k sequenced arthropod genomes. **Kristian Brevik** (kristian.a.brevik@gmail.com)[1], Yolanda Chen[1], Ania Muszewska[2], Sean Schoville[3] and Benjamin Pelissie[3], [1]Univ. of Vermont, Burlington, VT, [2]Polish Academy of Sciences, Warsaw, Poland, [3]Univ. of Wisconsin, Madison, WI

4:35 **SP1496** Comparative population genomics in halictid bees reveals the genetic underpinnings of social evolution. **Benjamin Rubin** (berubin@princeton.edu) and Sarah Kocher, Princeton Univ., Princeton, NJ

4:45 **SP1497** The first draft genome of the flesh fly and model organism *Sarcophaga* (*Liopygia*) *crassipalpis* Macquart, 1839 (Diptera: Sarcophagidae). **Eliana Buenaventura** (elianabuenaventura@gmail.com), Torsten Dikow, Paul Frandsen and Rebecca Dikow, Smithsonian Institution, Washington, DC

4:55 **Discussion**

Member Symposium: Breaking Down the Wall: Humans as Vectors of Invasive Species, Solutions for Research-Policy-Field Workflow, and Outbreaks

Meeting Room 501 (Convention Center)

Moderator and Organizer: John Leavengood, USDA - APHIS, Tampa, FL

1:30 **Introductory Remarks**

1:45 **1498** The challenges of flying exotic butterflies in Florida butterfly houses. **James Hayden** (james.hayden@freshfromflorida.com)[1], Jaret Daniels[2], Greg Hodges[1] and Phillip Lake[1], [1]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL, [2]Univ. of Florida, Gainesville, FL

2:00 **1499** Caterpillars in carry-ons: Lepidoptera entering the US in passenger baggage. **James Young** (jim.d.young@aphis.usda.gov), USDA - APHIS, Riverdale, MD

2:15 **1500** More window than wall: Taxonomic challenges for emerging invasive species. **Gary L. Miller** (gary.miller@ars.usda.gov)[1] and M. Alma Solis[2], [1]USDA - ARS, Beltsville, MD, [2]USDA - ARS, Washington, DC

2:30 **1501** The offshore cut flower industry: Risks and opportunities. **Amanda Hodges** (achodges@ufl.edu), Univ. of Florida, Gainesville, FL

2:45 **1502** Biopesticides: Past, present, and future of using native and exotic pathogens to control rangeland pests. **Larry E. Jech** (larry.e.jech@aphis.usda.gov) and Derek Woller, USDA - APHIS, Phoenix, AZ

3:00 **SP1503** Invasive species encroachment and dune stabilization in the Aeolian systems of southern Idaho and its impact on endemic species of greatest conservation need. **Ross Winton** (ross.winton@idfg.idaho.gov), Idaho Dept. of Fish and Game, Jerome, ID

3:10 **1504** An overview of regulatory and environmental compliance for plant pests and biocontrol organisms. **Colin Stewart** (colin.stewart@aphis.usda.gov) and Robert Tichenor, USDA - APHIS, Riverdale, MD

3:25 **Break**

3:40 **1505** Building a bridge: How research supports regulatory decisions to stem the spread of invasive species. **Lisa Neven** (lisa.neven@ars.usda.gov), USDA - ARS, Wapato, WA

3:55 **1506** Science-based quarantine protocols for the cattle fever tick eradication program. **Don Thomas** (donald.thomas@ars.usda.gov), USDA - ARS, Edinburg, TX

4:10 **1507** Zika response in the U.S.: Disease surveillance, vector control, and prevention policy from U.S. Navy perspective. **James Dunford** (james.c.dunford.mil@mail.mil), Navy and Marine Corps Public Health Center, Portsmouth, VA

4:25 **1508** The giant African snail eradication program in Florida. **Greg Hodges** (greg.hodges@freshfromflorida.com) and Tyson Emery, Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

4:40 **1509** 100 years of regulating exotic pests in Florida. **Trevor Smith** (trevor.smith@freshfromflorida.com), Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

4:55 **Panel Discussion**

Member Symposium: Emerging Pathogens and Parasites of Honey Bees

Meeting Room 709 (Convention Center)

Moderators and Organizers: Marta Guarna[1] and Jeffery Pettis[2], [1]Agriculture and Agri-Food Canada, Beaverlodge, AB, Canada, [2]Univ. of Bern, Bern, Switzerland

1:30 **Introductory Remarks**

1:35 **1510** Diseases without borders: Global pests and pathogens of honey bees. **Marta Guarna** (marta.guarna@canada.ca)[1] and Jeffery Pettis[2], [1]Agriculture and Agri-Food Canada, Beaverlodge, AB, Canada, [2]Univ. of Bern, Bern, Switzerland

1:50 **1511** *Tropilaelaps* spp.: The next Varroa? **Jeffery Pettis** (jeffery.pettis@vetsuisse.unibe.ch), Univ. of Bern, Bern, Switzerland

2:05 **1512** Tracking the changing strain diversity in the honey bee deformed wing virus. **Stephen Martin** (s.j.martin@salford.ac.uk) and Jess Kevill, Univ. of Salford, Manchester, United Kingdom

2:20 **1513** Honey bee viruses, colony health, and antiviral defense. **Michelle Flenniken** (michelleflenniken@gmail.com), Laura Brutscher and Alexander McMenamin, Montana State Univ., Bozeman, MT

2:35 **1514** *Nosema ceranae*: Understanding an enigmatic parasite of honey bees. **Stephen Pernal** (steve.pernal@agr.gc.ca), Agriculture and Agri-Food Canada, Beaverlodge, AB, Canada

2:50 **Break**

3:05 **1515** History of the emergence and control of European foulbrood. **Giles Budge** (giles.budge@fera.co.uk), Newcastle Univ., Newcastle upon Tyne, United Kingdom

3:35 **1516** Trypanosomatid parasites of honey bees. **Ryan Schwarz** (rsschwarz@fortlewis.edu)[1], Jevrosima Stevanovic[2], Branislav Vejnovic[2], Zoran Stanimirovic[2], Marta Guarna[3], Courtney MacInnis[3,4], Renata Borba[3,5], Patricia Wolf-Veiga[6], Stephen Pernal[3], Jay Evans[7] and Jeffery Pettis[8], [1]Fort Lewis College, Durango, CO, [2]Univ. of Belgrade, Belgrade, Serbia, [3]Agriculture and Agri-Food Canada, Beaverlodge, AB, Canada, [4]Univ. of Alberta, Edmonton, AB, Canada, [5]Univ. of British Columbia, Vancouver, BC, Canada, [6]Grand Prairie Regional College, Beaverlodge, AB, Canada, [7]USDA - ARS, Beltsville, MD, [8]Univ. of Bern, Bern, Switzerland

3:50 **1517** Metagenomic analysis of bee associated viruses. **David Galbraith** (dag5031@gmail.com), Zachary Fuller and Christina M. Grozinger, Pennsylvania State Univ., University Park, PA

4:05 **1518** Pathogen movement between honey bees and native bees: A two way street? **James P. Strange** (james.strange@ars.usda.gov), USDA - ARS, Logan, UT

4:20 **Panel Discussion**

Member Symposium: Igniting Entomological Innovation from Universities, Government, and Industry (the BCE Symposium)

Meeting Room 703 (Convention Center)

Moderators and Organizers: Zia Siddiqi[1], Shripat Kamble[2] and Mustapha Debboun[3], [1]Rollins, Atlanta, GA, [2]Univ. of Nebraska, Lincoln, NE, [3]Harris County Public Health, Houston, TX

1:30 **Introductory Remarks**

1:35 **1519** Igniting innovations from manufacturer's perspective. **Chris Keefer** (chris.keefer@syngenta.com), Syngenta, College Station, TX

1:50 **1520** Using big mosquito data to build better models of mosquito-borne diseases. **Ethan Jackson** (ejackson@microsoft.com), Microsoft, Redmond, WA

2:20 **1521** New approaches for urban IPM: Case studies on Argentine ant and drywood termite. **Dong-Hwan Choe** (donghwan.choe@ucr.edu), Univ. of California, Riverside, CA

2:35 **Break**

2:45 **1522** CDC: Developing and implementing vector surveillance and control technologies for the field. **Ben Beard** (cbeard@cdc.gov), Centers for Disease Control and Prevention, Fort Collins, CO

3:00 **1523** Presentation withdrawn

3:15 **1524** Igniting innovations among entomologists and its impact on the pest management industry. **Jim Fredericks** (jfredericks@pestworld.org), National Pest Management Association, Fairfax, VA

3:30 **Reception sponsored by Rollins, Inc.**

Member Symposium: Interdisciplinary Approaches to IPM

Meeting Room 401 (Convention Center)

Moderators and Organizers: Lauren Diepenbrock[1] and Philip Fanning[2], [1]North Carolina State Univ., Raleigh, NC, [2]Michigan State Univ., East Lansing, MI

1:30 **Introductory Remarks**

1:35 **1525** Time-lapse and GoPro video: Dual purposes for research and extension programs. **Anthony J. McMechan** (justin.mcmechan@gmail.com), Univ. of Nebraska, Lincoln, NE

1:50 **1526** Using unmanned aerial vehicles for scouting soybean aphid. **Zach Marston** (mars0368@umn.edu)[1], Tavvs Alves[2], Ian MacRae[3] and Robert Koch[1], [1]Univ. of Minnesota, St. Paul, MN, [2]National Council for Scientific and Technological Development, Brasília, Brazil, [3]Univ. of Minnesota, Crookston, MN

2:05 **1527** From bench to farm: Incorporating molecular tools and ecology in for the management of mobile, polyphagous pests. **Lauren Diepenbrock** (laurendiepenbrock@gmail.com), North Carolina State Univ., Raleigh, NC

2:20 **1528** The role of the circadian clock in photoperiodism in the spotted wing drosophila, *Drosophila suzukii*. **Antoine Abrieux** (aabrieux@ucdavis.edu) and Joanna Chiu, Univ. of California, Davis, CA

2:35 **Break**

2:50 **1529** Off-season behavior and biology of *Drosophila suzukii* and implications for its management. **Anna Wallingford** (akw52@cornell.edu) and Gregory Loeb, Cornell Univ., Geneva, NY

3:05 **1530** Severe induction of a native secondary pest by an invasive primary pest: The role of natural enemies. **Philip Fanning** (fanning9@msu.edu), Benjamin Johnson, Steven Van Timmeren and Rufus Isaacs, Michigan State Univ., East Lansing, MI

3:20 **1531** Integrative taxonomy improves understanding of native beneficial fauna: Revision of the Nearctic *Peristenus pallipes* complex (Hymenoptera: Braconidae) and implications for release of exotic biocontrol agents. Miles Zhang, Ryan Ridenbaugh and **Barbara Sharanowski** (barb.sharanowski@gmail.com), Univ. of Central Florida, Orlando, FL

3:35 **1532** Can phylogenetic relatedness predict the strength of plant-soil feedbacks and inform crop rotation? **Kathryn Ingerslew** (kingersl@purdue.edu) and Ian Kaplan, Purdue Univ., West Lafayette, IN

3:50 **Break**

4:05 **1533** Multi-scale land use effects on ant predation in agroecosystems. **Hannah J. Penn** (hannahjpenn@gmail.com)[1], Kacie J. Athey[2] and Brian Lee[2], [1]Miami Univ., Oxford, OH, [2]Univ. of Kentucky, Lexington, KY

4:20 **1534** Hemlock woolly adelgid suppression: From research to field implementation. **Elizabeth P. Benton** (ebenton@uga.edu)[1], Richard Cowles[2], Heather Slayton[3] and Nathan Hoover[3], [1]Univ. of Georgia, Tifton, GA, [2]Connecticut Agricultural Experiment Station, Windsor, CT, [3]Tennessee Division of Forestry, Livingston, TN

4:35 **1535** Agronomical practices and IPM: Establishing management techniques for the kudzu bug, an invasive soybean pest in the U.S. **Alejandro Del Pozo** (aidelpoz@ncsu.edu)[1], Dominic Reisig[2], Jack S. Bacheler[1] and Clyde Sorenson[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Plymouth, NC

4:50 **1536** Research and extension to improve biological control of leafhoppers in California vineyards. **Houston Wilson** (houston@berkeley.edu)[1], Kent Daane[2], Glenn McGourty[3], Lucia Varela[4] and Serguei Triapitsyn[5], [1]Univ. of California, Berkeley, CA, [2]Univ. of California, Parlier, CA, [3]Univ. of California Cooperative Extension, Ukiah, CA, [4]Univ. of California Cooperative Extension, Santa Rosa, CA, [5]Univ. of California, Riverside, CA

5:05 **1537** What's bugging them: The importance of building relationships in science communication. **Joe Ballenger** (joeballenger2005@gmail.com)[1], Nancy Miorelli[2] and Joanie Mars[2], [1]Randstad, Florissant, MO, [2]Univ. of Georgia, Athens, GA

5:20 **Concluding Remarks**

Member Symposium: Orthopteroids: Innovative Organisms to Ignite and Inspire Scientific Research and Communication

Meeting Room 505 (Convention Center)

Moderators and Organizers: Derek Woller[1] and Tyler Raszick[2], [1]USDA - ARS, Phoenix, AZ, [2]Texas A&M Univ., College Station, TX

1:30 **Introductory Remarks**

1:35 **1538** An evolutionary retrospective of the *Melanoplus* Puer group (Orthoptera: Acrididae). **Derek Woller** (asilid@gmail.com)[1,2] and Hojun Song[2], [1]USDA - ARS, Phoenix, AZ, [2]Texas A&M Univ., College Station, TX

1:50 **1539** Linking land use and the nutritional ecology of locusts: The case of the Senegalese locust (*Oedaleus senegalensis*). **Marion Le Gall** (marionlegall314@gmail.com) and Arianne Cease, Arizona State Univ., Tempe, AZ

2:05 **1540** Revealing the molecular architecture of locust phase polyphenism using RNAi on the Central-American locust (*Schistocerca piceifrons*) and non-swarming relatives. **Bert Foquet** (bertfoquet@tamu.edu) and Hojun Song, Texas A&M Univ., College Station, TX

2:20 **1541** Differences and similarities between Dictyoptera mitochondrial genomes. **Shiala Naranjo** (smorales20@knights.ucf.edu) and Hsin-Hsiung Huang, Univ. of Central Florida, Orlando, FL

2:35 **1542** Diversification patterns in neotropical grasshoppers: The case of the genus *Sphenarium* (Orthoptera: Pyrgomorphidea). **Oscar Salomon Sanabria-Urban** (sanabria_os@comunidad.unam.mx)[1], Hojun Song[2], Ken Oyama[3] and Raul Cueva del Castillo[1], [1]Univ. Nacional Autónoma de México, Tlalnepantla, Mexico, [2]Texas A&M Univ., College Station, TX, [3]CIECO - UNAM, Morelia, Mexico

2:50 **1543** A novel Plecoptera–angiosperm interaction: Flower visits, direct pollen feeding, and pollination by a stonefly species. **Akira Wong Sato** (ws.akira@gmail.com) and Makoto Kato, Kyoto Univ., Kyoto, Japan

3:05 **1544** Silk spinning motifs of the Embioptera: Insights from musicology. **Janice Edgerly-Rooks** (jedgerlyrooks@scu.edu), Brody Sandel, Isabel Regoli and Onyekachi Okolo, Santa Clara Univ., Santa Clara, CA

3:20 **Break**

3:35 **1545** Locust and grasshopper management worldwide: A challenge that inspires. **Alexandre Latchininsky** (latchini@uwyo.edu), Univ. of Wyoming, Laramie, WY

3:50 **1546** Survey of rangeland using remote sensing tools to assess forage saved. **Dustin Krompetz** (dustin.krompetz@m3cg.us), Michael Milam and Nathan Moses-Gonzales, M3 Consulting Group, Dayton, OH

4:05 **1547** Territoriality in *Reticulitermes*: Insights from field and lab studies. **Mark Janowiecki** (janowiecki@tamu.edu) and Edward Vargo, Texas A&M Univ., College Station, TX

4:20 **1548** Insights into the evolutionary history of the neotropical Romaleinae (Acridoidea, Orthoptera). **Martina Pocco** (martinapocco@fcnym.unlp.edu.ar)[1], Noelia Guzmán[2], Viviana Confalonieri[2], Hojun Song[3] and Maria Marta Cigliano[1], [1]Univ. Nacional de La Plata, CONICET, La Plata, Argentina, [2]Univ. de Buenos Aires, CONICET, Buenos Aires, Argentina, [3]Texas A&M Univ., College Station, TX

4:35 **1549** The future of orthopteran systematics. **Hojun Song** (hsong@tamu.edu), Texas A&M Univ., College Station, TX

5:05 **Concluding Remarks**

Member Symposium: The Acarological Society of America: Acarology in the Military

Meeting Room 504 (Convention Center)

Moderators and Organizers: David Nielsen[1] and Joel Hutcheson[2], [1]U.S. Army, Fort Sam Houston, TX, [2]National Veterinary Services Laboratories, Ames, IA

1:30 **Introductory Remarks**

1:35 **1550** Acarology in the military: An overview. **David Nielsen** (david.h.nielsen.mil@mail.mil), U.S. Army, Fort Sam Houston, TX

2:05 **1551** Army public health tick-borne disease surveillance in the eastern U.S.: Field studies. **Benedict Pagac** (ooo@ooo.com)[1] and Melissa K. Miller[2], [1]U.S. Army, Laurel, MD, [2]U.S. Army, Fort George G. Meade, MD

2:20 **1552** Army public health tick-borne disease surveillance in the eastern U.S.: Laboratory studies. **Melissa K. Miller** (melissa.miller2@us.army.mil), U.S. Army, Fort George G. Meade, MD

2:35 **1553** Monitoring changing risks: 20 years of tick and pathogen passive surveillance through the DoD Human Tick Test Kit Program. **Robyn Nadolny** (robyn.nadolny@gmail.com) and Ellen Stromdahl, Army Institute of Public Health, Aberdeen Proving Ground, MD

2:50 **Break**

3:10 **1554** Emergence of tick-borne diseases in Ohio: 2010-2016. **Glen Needham**[1], David Sanders[2,3] and Clarise Starr[4], [1]The Ohio State Univ., Columbus, OH, [2]Walter Reed National Military Medical Center, Bethesda, MD, [3]Defense Intelligence Agency, Bethesda, MD, [4]Air Force School of Aerospace Medicine, Wright Patterson Air Force Base, OH

3:25 **1555** Island time: Tick and mite-borne pathogens and the U.S. military. **Will Reeves** (will.k.reeves@aphis.usda.gov), USDA - APHIS, Fort Collins, CO

3:40 **1556** Tick DNA barcoding reveals many cryptic taxa: Implications for future biosurveillance efforts. Yvonne-Marie Linton[1], Anthony John[2], Angela Caranci[3], Suppaluck Polsonboom[4], Chien-Chung Chao[3], R. P. V. Jayanthe Rajapakse[5], Melissa K. Miller[6], Meagan Marshall[2], Connie Schmaljohn[5], David F. Hoel[7], Jittawadee Murphy[4], Nicole L. Achee[8], John Grieco[8], Joshua Bast[9,10], Richard Robbins[11] and **Reed Mitchell** (rzm0015@gmail.com)[11], [1]Natural History Museum, London, United Kingdom, [2]Army Public Health Command-Atlantic, Fort Meade, MD, [3]Naval Medical Research Center, Silver Spring, MD, [4]Uniformed Services Univ. of Health Sciences, Bethesda, MD, [5]Univ. of Peradeniya, Peradeniya, Sri Lanka, [6]U.S. Army, Fort George G. Meade, MD, [7]U.S. Navy, Gainesville, FL, [8]Univ. of Notre Dame, Notre Dame, IN, [9]U.S. Army Medical Research Unit, Dpo, AE, Kenya, [10]U.S. Army Medical Research Attachment, Tibilisi, Georgia, [11]Walter Reed Biosystematics Unit, Suitland, MD

3:55 **1557** Databases to shed light on human scrub typhus transmission potential. Daryl Kelly[1], **David Pecor** (pecord@si.edu)[2] and Allen Richards[3], [1]Naval Medical Research Center, Silver Spring, MD, [2]Walter Reed Biosystematics Unit, Suitland, MD, [3]Naval Medical Research Center, Bethesda, MD

4:10 **Concluding Remarks**

Member Symposium: The Westward Expansion of Japanese Beetle (Popillia japonica Newman): Encounters with Regulatory Entomology

Meeting Room 701 (Convention Center)

Moderators and Organizers: Clinton Burfitt[1] and Jason Leathers[2], [1]Oregon Dept. of Agriculture, Salem, OR, [2]California Dept. of Food and Agriculture, Sacramento, CA

1:30 **Welcoming Remarks**

1:35 **1558** The Japanese beetle at 101. **Michael G. Klein** (klein.10@osu.edu), The Ohio State Univ., Heber, AZ

1:50 **1559** Successful Japanese beetle eradication programs: Fun with federal, state and local agencies! **David Shetlar** (shetlar.1@osu.edu), The Ohio State Univ., Columbus, OH

2:05 **1560** Westward bound: A brief history of Japanese beetle exclusion and mitigation projects in Oregon. **Clinton Burfitt** (cburfitt@oda.state.or.us), Oregon Dept. of Agriculture, Salem, OR

2:20 **1561** The Orem, Utah Japanese beetle eradication. **Kristopher Watson** (kwatson@utah.gov)[1] and Clinton Burfitt[2], [1]Utah Dept. of Agriculture and Food, Salt Lake City, UT, [2]Oregon Dept. of Agriculture, Salem, OR

2:35 **1562** Japanese beetle: The California experience. **Jason Leathers** (jason.leathers@cdfa.ca.gov), California Dept. of Food and Agriculture, Sacramento, CA

2:50 **1563** Research to develop and improve Japanese beetle nursery regulatory treatments - Evolving stakeholder needs. **Jason B. Oliver** (joliver@tnstate.edu)[1], Karla Addesso[1], Anthony Witcher[1], Phillip A. Lewis[2], Michael Reding[3], Christopher Ranger[3] and Nadeer Youssef[1], [1]Tennessee State Univ., McMinnville, TN, [2]USDA - APHIS, Buzzards Bay, MA, [3]USDA - ARS, Wooster, OH

3:05 **Break**

3:20 **1564** Biological organisms of the Japanese beetle: Their status and availability. **Benjamin Puttler** (puttlerbe@Missouri.edu), Univ. of Missouri, Columbia, MO

3:35 **1565** Long-term suppression of Japanese beetle by *Ovavesicula popilliae*, a microsporidean pathogen. **David Smitley** (smitley@msu.edu), Michigan State Univ., East Lansing, MI

3:50 **1566** What biocontrols work against Japanese beetles? Food plants, tiphiid wasps, China, Japan, and the historical perspective of domestic and foreign biological control programs against Japanese beetles in North Carolina and Azores islands. **Richard C. McDonald** (drmcbug@skybest.com)[1] and Michael G. Klein[2], [1]Symbiont Biological Pest Management, Sugar Grove, NC, [2]The Ohio State Univ., Heber, AZ

4:05 **1567** Stable isotopes and Japanese beetles (*Popillia japonica* Newman) in Oregon: A management tool. **Diana N. Kearns** (dkearns@oda.state.or.us)[1] and Bruce A. Hungate[2], [1]Oregon Dept. of Agriculture, Salem, OR, [2]Northern Arizona Univ., Flagstaff, AZ

4:20 **1568** Improving the use of economic information for evaluating pest management programs: The case of the Japanese beetle (*Popillia japonica*). **Michael Thomas** (michael.thomas@famu.edu)[1], Trang Vo[2], Kevin Bigsby[3], Olya Rysin[3] and Alan Burnie[3], [1]Florida A&M Univ., Tallahassee, FL, [2]USDA - APHIS, Riverdale, MD, [3]USDA - APHIS, Raleigh, NC

4:35 **Discussion**

10-min: MUVE, Stored Products

Meeting Room 707 (Convention Center)

Moderators: Philip Bett[1], Pat Copps[2] and Xiang-Bing Yang[3], [1]Egerton Univ., Nakuru, Kenya, [2]Orkin Pest Control, Riverside, CA, [3]Univ. of California, Salinas, CA

1:30 **1569** Chemical composition and repellent efficacy of essential oils of Kenyan plants against *Tribolium castaneum, Acanthoscelides obtectus* and *Sitophilus zeamais*. **Philip Bett** (pkkbett@yahoo.co.uk), Arop Deng and Joshua Ogendo, Egerton Univ., Nakuru, Kenya

1:40 **1570** The effect of resource quality and species interactions on the dermestid beetle. **Sarah Aliahmad** (sarah.aliahmad@jjay.cuny.edu), John Jay College of Criminal Justice, Queens Village, NY

1:50 **1571** Efficacy of plant powders of *Eugenia aromatica* and *Azadirachta indica* on the rice moth, *Corcyra cephalonica* (Stainton) (Lepidoptera: Pyralidae) in stored cocoa beans. **Joseph Anikwe** (jachuks@yahoo.com)[1] and Adegoke Oyedokun[2], [1]Univ. of Lagos, Lagos, Nigeria, [2]Cocoa Research Institute of Nigeria, Ibadan, Nigeria

2:00 **1572** Distribution of aerosol insecticides in mills and storage warehouses. **Frank Arthur** (frank.arthur@ars.usda.gov), USDA - ARS, Manhattan, KS

2:10 **1573** Efficacy and residue analysis of nitric oxide fumigation for postharvest pest control. **Xiang-Bing Yang** (xbya@ucdavis.edu)[1] and Yong-Biao Liu[2], [1]Univ. of California, Salinas, CA, [2]USDA - ARS, Salinas, CA

2:20 **1574** Current status of nitric oxide fumigation research for postharvest pest control. **Yong-Biao Liu** (yongbiao.liu@ars.usda.gov)[1] and Xiang-Bing Yang[2], [1]USDA - ARS, Salinas, CA, [2]Univ. of California, Salinas, CA

2:30 **1575** Mycotoxin analysis of sorghum grain samples collected from major sorghum growing districts of Ethiopia. **Emana Degaga** (egetudegaga@yahoo.com), Addis Ababa Univ., Addis Ababa, Ethiopia

2:40 **1576** Industry perspective on the use of a pheromone to reduce risks from pesticides that may impact surface water quality. **Pat Copps** (pcopps@rollins.com), Orkin Pest Control, Riverside, CA

10-min: MUVE, Vector Competence and Genetics

Meeting Room 403 (Convention Center)

Moderators: Lisa D. Brown[1] and Jose Luis Ramirez[2], [1]Vanderbilt Univ., Nashville, TN, [2]USDA - ARS, Peoria, IL

1:30 **1577** Effect of larval hemocoelic infection on the biology of adult *Anopheles gambiae*. **Lisa D. Brown** (lisa.d.brown@vanderbilt.edu), Grayson Thompson and Julian F. Hillyer, Vanderbilt Univ., Nashville, TN

1:40 **1578** Temperature accelerates age-specific mortality and mediates immune senescence in malaria mosquitoes. **Lillian Shapiro** (lillian.l.shapiro@vanderbilt.edu)[1], Elizabeth Gaviria[2] and Julian F. Hillyer[1], [1]Vanderbilt Univ., Nashville, TN, [2]Nashville Public Schools, Nashville, TN

1:50 **1579** Fibrinogen domain of FREP1 is a broad spectrum malaria transmission-blocking vaccine antigen. **Jun Li** (lij@fiu.edu)[1], Guodong Niu[1], Caio Franca[2], Genwei Zhang[2], Wanlapa Roobsoong[3], Xiaohong Wang[1], Jetsumon Prachumsri[3] and Noah Butler[4], [1]Florida International Univ., Miami, FL, [2]Univ. of Oklahoma, Norman, OK, [3]Mahidol Univ., Bangkok, Thailand, [4]Univ. of Oklahoma, Oklahoma City, OK

2:00 **1580** Temporospatial immune modulation of a lethal interaction between the mosquito *Aedes aegypti* and entomopathogenic fungi. **Jose Luis Ramirez** (jose.ramirez@ars.usda.gov)[1], Christopher Dunlap[1], Ephantus Muturi[2] and Alejandro Rooney[1], [1]USDA - ARS, Peoria, IL, [2]Univ. of Illinois, Champaign, IL

2:10 **1581** Assessing the impact of temperature on the extrinsic incubation period of Zika virus in *Aedes aegypti*. Robert Zinna, Michael Pham, Nadia Collaco, Teresa K Joy and **Michael A. Riehle** (mriehle@ag.arizona.edu), Univ. of Arizona, Tucson, AZ

2:20 **1582** The Muta1 transposable element from *Aedes aegypti* is mobile in its host and other species. **Anna-Louise Doss** (adoss001@ucr.edu), Presha Shah and Peter Atkinson, Univ. of California, Riverside, CA

2:30 **1583** Transcriptional profile for *Aedes aegypti* from Florida in response to Zika virus. **Liming Zhao** (lmzhao@ufl.edu), Barry W. Alto and Dongyoung Shin, Univ. of Florida, Vero Beach, FL

2:40 **1584** Genomic consequences of selection against interspecific mating of female yellow fever mosquitoes, *Aedes aegypti*. **Martha Burford Reiskind** (mbreiski@ncsu.edu)[1], Paul Labadie[1], Irka E. Bargielowski[2], L. Philip Lounibos[2] and Michael Reiskind[1], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of Florida, Vero Beach, FL

2:50 **1585** Field application of self-limiting insects for management of disease vectors and agricultural pests. **Neil Morrison** (neil.morrison@oxitec.com), Oxitec Ltd, Oxford, United Kingdom

10-min: PBT, General Physiology 2

Meeting Room 304 (Convention Center)

Moderators: Michael Arvin and Jai-Hoon Eum, Univ. of Georgia, Athens, GA

1:30 **1586** Transcriptome sequencing to identify stage-specific gene expression. **Margaret Allen** (meg.allen@ars.usda.gov), USDA - ARS, Stoneville, MS

1:40 **1587** MicroRNA regulation of insect diapause. **Julie Reynolds** (reynolds.473@osu.edu)[1], Megan E. Meuti[2] and David L. Denlinger[1], [1]The Ohio State Univ., Columbus, OH, [2]Kenyon College, Gambier, OH

1:50 **1588** Preliminary analyses of the secreted proteins from the salivary glands of the wheat midge (*Sitodiplosis mosellana*) larvae. **Zainab A. A. Al-jbory** (aliz@ksu.edu)[1], Marion O. Harris[2], Omprakash Mittapalli[3] and Ming-Shun Chen[1,4], [1]Kansas State Univ., Manhattan, KS, [2]North Dakota State Univ., Fargo, ND, [3]The Ohio State Univ., Wooster, OH, [4]USDA - ARS, Manhattan, KS

2:00 **1589** Understanding genetic determinants of nutritional phenotypes in pea aphid (*Acyrthosiphon pisum*) using genome wide association study. **Seung Ho Chung** (sc776@cornell.edu) and Angela E. Douglas, Cornell Univ., Ithaca, NY

2:10 **1590** Trehalose transporter in the red flour beetles, *Tribolium castaneum*. **Jingjing Xu** (jingjing@apexbait.com), Apex Bait Technologies, Inc, Santa Clara, CA

2:20 **1591** Identification of putative effectors of *Graminella nigrifrons*, blackfaced leafhopper. **Swapna Priya Rajarapu** (rajarapu.1@osu.edu), Raman Bansal and Andrew Michel, The Ohio State Univ., Wooster, OH

2:30 **1592** Differential gene expression *Helicoverpa zea* in response to feeding on different types of plant tissues. **Richard Musser** (ro-musser@wiu.edu), Ammar Al-Furaiji and Sue Hum-Musser, Western Illinois Univ., Macomb, IL

2:40 **1593** Identification of Egf1.0 related proteins during melanization suppression of hemolymph in *Bombyx mori*. **Jai-Hoon Eum** (jheum@uga.edu), Univ. of Georgia, Athens, GA

2:50 **Break**

3:00 **1594** Functional and phenotypic analysis of transferrin from *Drosophila melanogaster*. **Maureen Gorman** (mgorman@ksu.edu), Lisa Brummett, Leslie LeSuer and Michael Kanost, Kansas State Univ., Manhattan, KS

3:10 **1595** Atypical $iPLA_2$ encoded in *Spodoptera exigua* mediates cellular immunity. **Yonggyun Kim** (hosanna@anu.ac.kr), Andong National Univ., Andong, South Korea

3:20 **1596** Comparative assessment of the thermal tolerance of spotted stemborer, *Chilo partellus* Swinhoe (Lepidoptera: Crambidae) and its larval parasitoid, *Cotesia sesamiae* Cameron (Hymenoptera: Braconidae). **Reyard Mutamiswa** (reyard.mutamiswa@studentmail.biust.ac.bw)[1], Frank Chidawanyika[2] and Casper Nyamukondiwa[1], [1]Botswana International Univ. of Science and Technology, Palapye, Botswana, [2]Agricultural Research Council, Hilton, South Africa

3:30 **1597** Effects of host availability and diet on the biology of *Pachycrepoideus vindemiae* (Hymenoptera: Pteromalidae). **Cherre Bezerra Da Silva** (entomologista@gmail.com), Briana Price, Alexander SooHoo-Hui and Vaughn Walton, Oregon State Univ., Corvallis, OR

3:40 **1598** Alimentary tract protozoans associated with *Bagrada hilaris* (Burmeister). **Michael Grodowitz** (michael.grodowitz@ars.usda.gov)[1], Dawn Gundersen-Rindal[2], Brad Elliott[1] and Michael Sparks[2], [1]USDA - ARS, Stoneville, MS, [2]USDA - ARS, Beltsville, MD

3:50 **1599** Whitefly adult age and virus coat protein jointly determine transovarial transmission of begomoviruses. Jing Wei, Ya-Zhou He and **Shu-Sheng Liu** (shshliu@zju.edu.cn), Zhejiang Univ., Hangzhou, China

4:00 **1600** DNA amplficiation and processing of *Microplitis demolitor* bracovirus. **Michael Arvin** (michaelarvin.nl@gmail.com), Michael Strand and Gaelen Burke, Univ. of Georgia, Athens, GA

4:10 **1601** Virus infection alters expression of transcripts with enriched abundance in the salivary gland of *Frankliniella occidentalis*. **Sulley Ben-Mahmoud** (sbenmahmoud@ucdavis.edu)[1], Dorith Rotenberg[2], Joshua Benoit[3], Michelle Sung[1] and Diane E. Ullman[1], [1]Univ. of California, Davis, CA, [2]Kansas State Univ., Manhattan, KS, [3]Univ. of Cincinnati, Cincinnati, OH

10-min: PBT, Pest Control

Meeting Room 506 (Convention Center)

Moderators: Thais B. Rodrigues[1] and Raymond L. St. Leger[2], [1]Univ. of Kentucky, Lexington, KY, [2]Univ. of Maryland, College Park, MD

1:30 **1602** The *Drosophila* model system for analyzing natural variation in resistance to *Metarhizium* spp. biocontrol agents. **Raymond J. St. Leger** (stleger@umd.edu) and Jonathan Wang, Univ. of Maryland, College Park, MD

1:40 **1603** Effects of neem essential oil on immunocompetence in *Galleria mellonella* larvae. **Maciej A. Pszczolkowski** (mpszczolkowski@missouristate.edu), Missouri State Univ., Mountain Grove, MO

1:50 **1604** *Drosophila suzukii* Population Collection (DSPC): A tool for studying local adaptation in an invasive pest. **Nicholas Teets** (n.teets@uky.edu) and Mark Garcia, Univ. of Kentucky, Lexington, KY

2:00 **1605** Effect of reduced risk insecticides on the fecundity, larval emergence, pupation and adult emergence of *Tribolium castaneum* (Herbst). **Mansoor ul Hasan** (mansoorsahi2000@yahoo.com)[1], Qurban Ali[2], Shahzad Saleem[3], Rab Nawaz[1] and Najuf Awais Anjum[2], [1]Univ. of Agriculture, Faisalabad, Pakistan, [2]Ayub Agricultural Research Institute, Faisalabad, Pakistan, [3]COMSATS Institute of Information Technology, Sahiwal, Pakistan

2:10 **1606** Presentation withdrawn

2:20 **1607** Evaluation of some plant oil extracts against phytophagous mites (*Tetranychus* species) (Tetranychidae: Acari). **Bilal Khan** (dr.bilal.saeed@uaf.edu.pk), Univ. of Agriculture, Faisalabad, Pakistan

2:30 **1608** Control of brown marmorated stink bug (*Halyomorpha halys*) using RNAi as a molecular biopesticide: From delivery to phenotype. **Saikat Kumar Ghosh** (saikat.ghosh@ars.usda.gov)[1], Wayne Hunter[2] and Dawn Gundersen-Rindal[1], [1]USDA - ARS, Beltsville, MD, [2]USDA - ARS, Fort Pierce, FL

2:40 **1609** Evaluation of the systemic action of neem (*Azadirachta indica* A. Juss) seed products against the desert locust immatures [*Schistocerca gregaria* (Forskal)] (Orthoptera: Acrididae). **Azhari Abdelbagi** (azharibagi@yahoo.com), Magzoub El Amin, Abd Elaziz Ishag and Ahmed Hammad, Univ. of Khartoum, Khartoum, Sudan

2:50 **Break**

3:00 **1610** Monitoring of four major lepidopteran pests in cornfields and management of *Helicoverpa armigera*. **Juil Kim** (forweek@korea.kr) and Min Kwon, National Institute of Crop Science, Pyeongchang, South Korea

3:10 **1611** RNAi technology to manage emerald ash borer (*Agrilus planipennis*). **Thais B. Rodrigues** (thaisbarros.bio@gmail.com), Lynne Rieske Kinney and Subba Reddy Palli, Univ. of Kentucky, Lexington, KY

3:20 **1612** Age and gender-dependent mortality of common spider mite, *Tetranychus urticae*, treated by spirotetramat (Movento Energy SC). **Sergei Popov** (sergei_ya_popov@mail.ru)[1] and Andrei Alyokhin[2], [1]Russian Timiryazev State Agrarian Univ., Moscow, Russia, [2]Univ. of Maine, Orono, ME

3:30 **1613** Evaluation of the efficiency of some insecticides in controlling of longhorn beetle *Cerambyx dux* F. (Cerambycidae, Coleoptera). **Ehab Zgheb** (szgheb@yahoo.com), Damascus Univ., Damascus, Syria

3:40 **1614** Control of Oriental fruit fly *Bactrocera dorsalis* Hendel (Diptera: Tephritidae) populations infesting mango (*Mangifera indica*) using methyl eugenol. **Elechi Asawalam** (elechiasw@yahoo.com), Michael Okpara, Univ. of Agriculture, Umuahia, Nigeria

3:50 **1615** Control of western corn rootworm (*Diabrotica virgifera virgifera* LeConte) reproduction through plant-mediated RNA interference. **Xiping Niu** (xiping.niu@pioneer.com)[1], Adane Kassa[1], Xu Hu[1], Jon Robeson[1], Mollie McMahon[1], Nina Richtman[1], Joe Steimel[1], Bliss Kernodle[1], Virginia Crane[1], Gary Sandahl[1], Julie Ritland[1], James Presnail[2], Albert Lu[1] and Gusui Wu[1], [1]DuPont Pioneer, Johnston, IA, [2]Evogene Inc, St. Louis, MO

4:00 **1616** Tentative use of electromagnetic field to control insects in stored produces. **Francoise Djibode Favi** (ffavi@vsu.edu), Virginia State Univ., Petersburg, VA

4:10 **1617** Effect of parasitization by *Apanteles syleptae* F. (Hymenoptera: Braconidae), plant extract and chemical insecticide on olive leaf moth, *Palpita unionalis* Hübner (Lepidoptera: Pyralidae) haemolymph. **Mona El-Mandarawy** (melmandarawy@gmail.com), Plant Protection Research Institute, Giza, Egypt

4:20 **1618** Engineering species-like barriers: A new paradigm for genetic biocontainment and biocontrol. **Maciej Maselko** (mmaselko@umn.edu)[1], Stephen Heinsch[1], Jeremy Chacon[1], William Harcombe[1], Michael O'Connor[2] and Michael Smanski[1], [1]Univ. of Minnesota, St. Paul, MN, [2]Univ. of Minnesota, Minneapolis, MN

10-min: PBT, Vector Physiology

Meeting Room 405 (Convention Center)

Moderators: David C. Rinker[1] and Kevin Vogel[2], [1]Vanderbilt Univ., Nashville, TN, [2]Univ. of Georgia, Athens, GA

1:30 **1619** Assessment of spray efficacy and resistance status during a West Nile virus and Saint Louis encephalitis virus outbreak in Maricopa County, AZ. **Mariah "Cassie" Scott** (gni6@cdc.gov)[1], Janet McAllister[1], Kirk Smith[2], James Will[2], Steven Young[2] and John Townsend[2], [1]Centers for Disease Control and Prevention, Fort Collins, CO, [2]Maricopa County Environmental Services Dept., Phoenix, AZ

1:40 **1620** Transcriptome sequencing reveals large-scale changes in axenic *Aedes aegypti* larvae. **Kevin Vogel** (kjvogel@uga.edu), Luca Valzania, Kerri Coon, Mark Brown and Michael Strand, Univ. of Georgia, Athens, GA

1:50 **1621** Unraveling the relationship between the Tsetse fly and its obligate symbiont *Wigglesworthia*: Transcriptomic and metabolomic landscapes reveals highly integrated physiological networks. **Geoffrey Attardo** (geoffrey.attardo@yale.edu)[1,2], Xiaoli Bing[3], Aurélien Vigneron[1], Emre Aksoy[4], Francesca Scolari[5], Anna Malacrida[5], Brian Weiss[1] and Serap Aksoy[1], [1]Yale Univ., New Haven, CT, [2]Univ. of California, Davis, CA, [3]Cornell Univ., Ithaca, NY, [4]Univ. of California, Riverside, CA, [5]Univ. of Pavia, Pavia, Italy

2:00 **1622** A comprehensive transcriptome profile of the heart of *Anopheles gambiae*. **David C. Rinker** (david.rinker@vanderbilt.edu), Leah T. Sigle, John A. Capra and Julian F. Hillyer, Vanderbilt Univ., Nashville, TN

2:10 **1623** FBN30 in wild *Anopheles gambiae* functions as a pathogen recognition molecule against clinically circulating *Plasmodium falciparum* in malaria endemic areas in Kenya. **Guodong Niu** (gniu@fiu.edu)[1], Jun Li[1], Genwei Zhang[2], Caio Franca[2], Yingjun Cui[1], Stephen Munga[3] and Yaw Afrane[3], [1]Florida International Univ., Miami, FL, [2]Univ. of Oklahoma, Norman, OK, [3]Kenya Medical Research Institute, Kisumu, Kenya

2:20 **1624** Presentation withdrawn

2:30 **1625** Dopamine modulation of host learning in *Aedes aegypti* mosquitoes. **Clement Vinauger** (vinauger@uw.edu)[1], Chloé Lahondère[1], Gabriella Wolff[1], Lauren Locke[1], Jessica Liaw[1], Jay Parrish[1], Omar Akbari[2], Michael Dickinson[3] and Jeff Riffell[1], [1]Univ. of Washington, Seattle, WA, [2]Univ. of California, Riverside, CA, [3]California Institute of Technology, Pasadena, CA

2:40 **1626** Identification of *Anopheles gambiae* mosquito midgut proteins involved in *Plasmodium falciparum* invasion. **Yingjun Cui** (yicui@fiu.edu), Guodong Niu, Xiaohong Wang and Jun Li, Florida International Univ., Miami, FL

2:50 **1627** Bacteria-mediated hypoxia functions as an essential signal for mosquito development. **Kerri Coon** (kerri.coon@utexas.edu)[1], Luca Valzania[2], David A. McKinney[2], Kevin Vogel[2], Mark Brown[2] and Michael Strand[2], [1]Univ. of Texas, Austin, TX, [2]Univ. of Georgia, Athens, GA

3:00 **1628** Presentation withdrawn

3:10 **1629** The midgut microbiota plays an essential role in *Phlebotomus duboscqi* sand fly vector competence for *Leishmania major*. **Isabelle Louradour** (isabelle.louradour@nih.gov)[1], Carolina Cunha Monteiro[2], Ehud Inbar[1], Kashinath Ghosh[1], Phillip Lawyer[1], Andrea Paun[1], Margery Smelkinson[1], Nagila Secundino[2], Michael Lewis[3], Dinesh Erram[4], Ludek Zurek[4] and David Sacks[1], [1]National Institutes of Health, Bethesda, MD, [2]Centro de Pesquisas René Rachou, Belo Horizonte, Brazil, [3]London School of Hygiene and Tropical Medicine, London, United Kingdom, [4]Kansas State Univ., Manhattan, KS

3:20 **1630** Insecticide resistance evaluation of *Culex pipens* in treated versus untreated areas of Larimer County, Colorado. **Milena Guajardo** (kri2@cdc.gov)[1], Mariah "Cassie" Scott[1], Broox Boze[2], Skyler Griffin[3], Ashley Gramza[3] and Janet McAllister[1], [1]Centers for Disease Control and Prevention, Fort Collins, CO, [2]Vector Disease Control International, Little Rock, AR, [3]Colorado Mosquito Control, Loveland, CO

10-min: P-IE, Biocontrol, Predators and Pathogens

Meeting Room 708 (Convention Center)

Moderators: Rosemary Gutierrez[1] and Ann E. Hajek[2], [1]Univ. of Hawai'i, Honolulu, HI, [2]Cornell Univ., Ithaca, NY

1:30 **1631** PCR-based gut content analysis to detect cryptic predation on macadamia felted coccid (Hemiptera: Eriococcidae) by Coleoptera: Coccinellidae species in macadamia nut orchards. **Rosemary Gutierrez** (gr6@hawaii.edu)[1], Ishakh Pulakkatu-Thodi[1], Mark Wright[1], Scott Geib[2] and Nicole Yoneishi[2], [1]Univ. of Hawai'i, Honolulu, HI, [2]USDA - ARS, Hilo, HI

1:40 **1632** Current status of silver flies as biocontrol agents of hemlock woolly adelgid in the eastern U.S. **Darrell W. Ross** (darrell.ross@oregonstate.edu)[1], Kimberly Wallin[2], Nathan Havill[3], Albert Mayfield[4], Mark Whitmore[5], Alexander Rose[1] and Stephen D. Gaimari[6], [1]Oregon State Univ., Corvallis, OR, [2]Univ. of Vermont, Burlington, VT, [3]USDA - Forest Service, Hamden, CT, [4]USDA - Forest Service, Asheville, NC, [5]Cornell Univ., Ithaca, NY, [6]Plant Pest Diagnostics Branch, Sacramento, CA

1:50 **1633** Predator exclusion: A better way to measure the effect of natural enemies on mountain pine beetle (*Dendroctonus ponderosae*). **Lawrence Haimowitz** (lhaimowi@uwyo.edu), Univ. of Wyoming, Laramie, WY

2:00 **1634** Density-dependent foraging of *Galendromus flumenis* (Acari: Phytoseiidae) on Banks grass mite. **Fatemeh Ganjisaffar** (fatemeh.ganjisaffar@email.ucr.edu)[1], Gösta Nachman[2] and Thomas M. Perring[1], [1]Univ. of California, Riverside, CA, [2]Univ. of Copenhagen, Copenhagen, Denmark

2:10 **1635** Function of supplemental foods on improving the establishment of generalist predators *Orius insidiosus* and *Dicyphus hesperus*. **Roselyne Labbe** (roselyne.labbe@agr.gc.ca) and Les Shipp, Agriculture and Agri-Food Canada, Harrow, ON, Canada

2:20 **Break**

2:30 **1636** Microbial control of sweetpotato weevil (*Cylas spp.*) in sub-Saharan Africa. **Brooke Bissinger** (bbissinger@agbiome.com)[1], Chad Keyser[1], Jeffrey Davis[2], Sinnikka Smith[1] and James Trimble[1], [1]AgBiome, Inc, Research Triangle Park, NC, [2]Louisiana State Univ., Baton Rouge, LA

2:40 **1637** New microsporidian species infecting invasive and native stink bugs. **Ann E. Hajek** (aeh4@cornell.edu)[1], Leellen Solter[2] and James J. Becnel[3], [1]Cornell Univ., Ithaca, NY, [2]Illinois Natural History Survey, Champaign, IL, [3]USDA - ARS, Gainesville, FL

2:50 **1638** Scared sick: Effect of predator-induced stress on herbivore survival against pathogens. **Zhen Fu** (zhen.fu@wsu.edu) and William Snyder, Washington State Univ., Pullman, WA

3:00 **1639** Biological control of rangeland pest grasshoppers (Orthoptera: Acrididae) using bait formulation of a fungal pathogen *Metarhizium robertsii* DWR2009 (Hypocreales: Clavicipitaceae). **Lee Noel** (lnoel2@uwyo.edu) and Alexandre Latchininsky, Univ. of Wyoming, Laramie, WY

3:10 **1640** Development and field validation of a strategy for controlling Asian citrus psyllid on residential citrus by autodissemination of the entomopathogenic fungus, *Isaria fumosorosea*. **Andrew Chow** (andrew.chow@tamuk.edu)[1], Joseph Patt[2] and Mamoudou Setamou[1], [1]Texas A&M Univ., Weslaco, TX, [2]USDA - ARS, Fort Pierce, FL

3:20 **1641** Developmental pleiotropies associated with limb regeneration in *Harmonia axyridis* (Coleoptera: Coccinellidae) have transgenerational effects. **Ahmed Abdelwahab** (nanahmed2007@yahoo.com)[1], J. P. Michaud[2] and Mohamed Bayoumy[1], [1]Mansoura Univ., Mansoura, Egypt, [2]Kansas State Univ., Hays, KS

3:30 **1642** Pathogen evolution and infection spread in cannibalistic host populations. **Asaf Sadeh** (asafsa@volcani.agri.gov.il)[1] and Jay Rosenheim[2], [1]Agricultural Research Organization, Rishon Letsion, Israel, [2]Univ. of California, Davis, CA

10-min: P-IE, IPM, Field Crops 2

Meeting Room 507 (Convention Center)

Moderators: Patricia Prasifka[1] and Randa Jabbour[2], [1]Dow AgroSciences, West Fargo, ND, [2]Univ. of Wyoming, Laramie, WY

1:30 **1643** Evaluating the efficacy of foliar insecticides for soybean aphids in South Dakota. **Cole Dierks** (cole.dierks@sdstate.edu), Philip Rozeboom, Brady Hauswedell and Adam Varenhorst, South Dakota State Univ., Brookings, SD

1:40 **1644** Isoclast™ Active for management of soybean aphid: Application timing, efficacy and yield. **Patricia Prasifka** (plprasifka@dow.com)[1], Dave Ruen[2], Robert Koch[3], Bruce D. Potter[4], Erin Hodgson[5], Janet Knodel[6] and Deirdre Prischmann-Voldseth[6], [1]Dow AgroSciences, West Fargo, ND, [2]Dow AgroSciences, Lanesboro, MN, [3]Univ. of Minnesota, St. Paul, MN, [4]Univ. of Minnesota, Lamberton, MN, [5]Iowa State Univ., Ames, IA, [6]North Dakota State Univ., Fargo, ND

1:50 **1645** IPD072 from *Pseudomonas chloroaphis* represents a new mode of action against western corn rootworm, *Diaborica virgifera virgifera* (LeConte). **Mark Nelson** (mark.e.nelson@pioneer.com)[1], Nuria Jiménez-Juárez[1], Claudia Pérez-Ortega[1], Jarred Oral[2], Ute Schellenberger[3], Lu Liu[2] and Gusui Wu[1], [1]DuPont Pioneer, Johnston, IA, [2]DuPont Pioneer, Hayward, CA, [3]OMT Therapeutics, Palo Alto, CA

2:00 **1646** Effectiveness of native vs. non-native entomopathogenic nematodes (*Heterorhabditis bacteriophora*) on the control of *Diabrotica virgifera virgifera* in Missouri corn fields. **Ryan Geisert** (rwg5h8@mail.missouri.edu)[1], Thomas Coudron[1], Kent S. Shelby[1], Bruce Hibbard[1] and Elson J. Shields[2], [1]USDA - ARS, Columbia, MO, [2]Cornell Univ., Ithaca, NY

2:10 **1647** Expanding biotechnology approaches to control western corn rootworm with new insecticidal proteins. **Stanislaw Flasinski** (stanislaw.flasinski@monsanto.com)[1], Yong Yin[1], David Bowen[2] and James Roberts[2], [1]Monsanto Company, St. Louis, MO, [2]Monsanto Company, Chesterfield, MO

2:20 **1648** Steward® EC (indoxacarb): A new mode of action insecticide for control of corn rootworm adults and other key pests in corn. **Hector E. Portillo** (hector.e.portillo@dupont.com)[1], Victor B. Steward[2], Jeffrey Krumm[3], Jeff Meredith[4], Julie Peterson[5] and Sarah Zukoff[6], [1]DuPont Crop Protection, Newark, DE, [2]DuPont Crop Protection, Overland Park, KS, [3]DuPont Crop Protection, Hastings, NE, [4]DuPont Crop Protection, Memphis, TN, [5]Univ. of Nebraska, North Platte, NE, [6]Kansas State Univ., Garden City, KS

2:30 **1649** Management of injury by *Striacosta albicosta* (Lepidoptera: Noctuidae) and deoxynivalenol content in maize. **Jocelyn Smith** (jocelyn.smith@uoguelph.ca), Victor Limay-Rios and Art Schaafsma, Univ. of Guelph, Ridgetown, ON, Canada

2:40 **Break**

2:50 **1650** Development of near-real time weather based insect pest prediction models for cereal and forage pests in Alberta, Canada. **Swaroop Kher** (swaroop.kher@gov.ab.ca)[1], Daniel Itenfisu[1] and Scott Meers[2], [1]Government of Alberta, Edmonton, AB, Canada, [2]Alberta Agriculture and Rural Development, Brooks, AB, Canada

3:00 **1651** Cereal aphid manager: A dynamic action threshold smartphone application for scouting cereal aphids. **Tyler Wist** (tyler.wist@agr.gc.ca)[1], Erl Svendsen[1] and John Gavloski[2], [1]Agriculture and Agri-Food Canada, Saskatoon, SK, Canada, [2]Manitoba Agriculture, Carman, MB, Canada

3:10 **1652** Economics of winter insect pest mangement of alfalfa hay in the southwestern desert of the U.S. **Ayman Mostafa** (ayman@email.arizona.edu), Univ. of Arizona, Phoenix, AZ; Univ. of Arizona, Tucson, AZ

3:20 **1653** Producer priorities and perceptions of alfalfa insect pests. **Randa Jabbour** (rjabbour@uwyo.edu) and Shiri Noy, Univ. of Wyoming, Laramie, WY

3:30 **1654** Influence of tillage systems on diversity and abundance of insect and nematode pests of maize in Malete, Kwara State, Nigeria. **Ismaila Aderolu** (adeisma@yahoo.com), Oluwafemi Lawal, Adesina Wahab, Khadijat Alabi, Oluremi Osunlola and Muhydeen Giwa, Kwara State Univ., Ilorin, Nigeria

3:40 **1655** Presentation withdrawn

3:50 **1656** RNA interference of midgut gene-*dvssj1* for the control of corn rootworm. **Xu Hu** (xu.hu@pioneer.com), Deirdre Kapka-Kitzman, Courtney Davis Vogel, Joe Steimel, Nina Richtman, Adane Kassa, John Mathis, Mark Nelson, Albert Lu and Gusui Wu, DuPont Pioneer, Johnston, IA

4:00 **1657** Building and sustaining scientific expertise in industry: Supporting functions required for a successful field-based research operation. **Amanda Jacobson** (ajjacobson@dow.com), Monica Sorribas, Jon Babcock, Marc Fisher, Robert Masters and Byron Sleugh, Dow AgroSciences, Indianapolis, IN

10-min: P-IE, Vectors of Plant Disease

Meeting Room 503 (Convention Center)

Moderators: Laura Ingwell[1] and Rajagopalbabu Srinivasan[2], [1]Purdue Univ., West Lafayette, IN, [2]Univ. of Georgia, Tifton, GA

1:30 **1658** Monitoring thrips vectors of soybean vein necrosis virus (SVNV) in Alabama soybean. **Anitha Chitturi** (azc0084@auburn.edu), Alana Jacobson, Edward Sikora and Kassie Conner, Auburn Univ., Auburn, AL

1:40 **1659** Survey for thrips and viruses (Tospoviridae) and their management in Texas. **Steven Arthurs** (sarthurs@tamu.edu) and Kevin Heinz, Texas A&M Univ., College Station, TX

1:50 **1660** Effects of systemic insecticides on whitefly transmission and incidence of a cucurbit virus. **Steven J. Castle** (steven.castle@ars.usda.gov)[1] and John Palumbo[2], [1]USDA - ARS, Maricopa, AZ, [2]Univ. of Arizona, Yuma, AZ

2:00 **1661** Presentation withdrawn

2:10 **1662** Bean golden yellow mosaic virus and sweetpotato whitefly *Bemisia tabaci* (Gennadius) B biotype (Insecta: Hemiptera: Aleyrodidae). **Dakshina Seal** (dseal@lfas.ufl.edu), Rafia Khan and Catherine Sabines, Univ. of Florida, Homestead, FL

2:20 **1663** Plant virus infection modulates the preference and fitness of its vector, whitefly (*Bemisia tabaci* Gennadius). **Rajagopalbabu Srinivasan** (babusri@uga.edu)[1], Saioa Legarrea[2], Wendy G. Marchant[1] and Saurabh Gautam[1], [1]Univ. of Georgia, Tifton, GA, [2]Institute for Biodiversity and Ecosystem Dynamics, Amsterdam, Netherlands

2:30 **1664** Whitefly midgut wall affects the specificity and efficiency of PaLCuCNV penetration into vector hemolymph. **Zhao Jing** (swuzhj19940215@163.com), Guo Tao, Shu-Sheng Liu and Xiao-Wei Wang, Zhejiang Univ., Hangzhou, China

2:40 **1665** Comparison of transovarial transmission of tomato yellow leaf curl virus by seven cryptic species of the *Bemisia tabaci* whitefly complex indigenous to China. **Qi Guo** (guoqi@zju.edu.cn), Shu-Sheng Liu and Xiao-Wei Wang, Zhejiang Univ., Hangzhou, China

2:50 **1666** Replication of a plant virus in its insect vector is mediated by activation of c-Jun transcription factor. **Xin-Ru Wang** (wangxinru002@163.com), Yin-Quan Liu, Shu-Sheng Liu and Xiao-Wei Wang, Zhejiang Univ., Hangzhou, China

3:00 **Break**

3:10 **1667** Does the endosymbiont Rickettsia modify the feeding behavior of its insect host? **Quentin Chesnais** (quentin.chesnais@ucr.edu)[1], Martha Hunter[2], Suzanne E. Kelly[2], Ian Wright[1] and Kerry Mauck[1], [1]Univ. of California, Riverside, CA, [2]Univ. of Arizona, Tucson, AZ

3:20 **1668** New approaches to managing cucumber beetles and bacterial wilt. **Laura Ingwell** (laura.ingwell@gmail.com) and Ian Kaplan, Purdue Univ., West Lafayette, IN

3:30 **1669** Managing rose rosette disease that is vectored by the eriophyid mite, *Phyllocoptes fructiphilus*. **Frank Hale** (fahale@utk.edu)[1], Mark T. Windham[2], Alan Windham[1], Qunkang Cheng[2], Katherine Solo[2], Brent England[3] and Walt Hitch[3], [1]Univ. of Tennessee, Nashville, TN, [2]Univ. of Tennessee, Knoxville, TN, [3]Univ. of Tennessee, Crossville, TN

3:40 **1670** Electropenetrography monitoring of Asian citrus psyllid (Hemiptera: Liviidae) stylet penetration on flonicamid treated citrus leaf tissue. **Ki Kim** (ki@pacificaggroup.com)[1], Sean Whipple[2] and Timothy Ebert[3], [1]Florida Ag Research, Thonotosassa, FL, [2]ISK Biosciences Corporation, Kearney, MO, [3]Univ. of Florida, Lake Alfred, FL

3:50 **1671** Virus transmission ecology and phenology of treehoppers in Oregon vineyards. **Daniel Dalton** (daniel.dalton@oregonstate.edu)[1], Richard Hilton[2] and Vaughn Walton[1], [1]Oregon State Univ., Corvallis, OR, [2]Oregon State Univ., Central Point, OR

4:00 **1672** Treehoppers associated with vineyards in southern Oregon. **Richard Hilton** (richard.hilton@oregonstate.edu)[1], Vaughn Walton[2] and Daniel Dalton[2], [1]Oregon State Univ., Central Point, OR, [2]Oregon State Univ., Corvallis, OR

4:10 **1673** Epidemiology of Pierce's disease in the southern San Joaquin Valley of California. **Mark Sisterson** (mark.sisterson@ars.usda.gov)[1], Lindsey Burbank[1], David R. Haviland[2], Rodrigo Krugner[1] and Drake Stenger[1], [1]USDA - ARS, Parlier, CA, [2]Univ. of California Cooperative Extension, Bakersfield, CA

4:20 **1674** Detection of vectors and pathogens in insect trap metagenomes using E-probe diagnostic nucleic acid assays. **William Schneider** (william.schneider@ars.usda.gov)[1], Andrew Stone[1], Diana Sherman[1], Aline Bronzato[2] and Jonas G. King[2], [1]USDA - ARS, Fort Detrick, MD, [2]Mississippi State Univ., Mississippi State, MS

Organized Meeting: International Branch Meeting

Meeting Room 707 (Convention Center)

Moderators and Organizers: Megha Parajulee[1], Maya Evenden[2], Livy Williams[3], Maggie Hardy[4], Rory J. McDonnell[5] and Ayyasamy Regupathy[6], [1]Texas A&M Univ., Lubbock, TX, [2]Univ. of Alberta, Edmonton, AB, Canada, [3]USDA - ARS, Charleston, SC, [4]Univ. of Queensland, Brisbane, Australia, [5]Oregon State Univ., Corvallis, OR, [6]Annamalai Univ., Chidambaram, India

3:30 **Welcome, introductory remarks, and awards presentation**

3:45 **1675** Presentation by the recipient of the 2017 John Henry Comstock Graduate Student Award: The genetic and mechanistic basis of worker sterility in the honey bee. **Isobel Ronai** (isobel.ronai@sydney.edu.au), Univ. of Sydney, Sydney, Australia

4:15 **1676** Presentation by the recipient of the 2017 International Branch Distinguished Scientist Award: Forty-three years of stink bug research: It's been fun so far. **Antônio Panizzi** (antonio.panizzi@embrapa.br), Embrapa National Wheat Research Center, Passo Fundo, Brazil

4:45 **Recognition of newly elected officers**

4:55 **News from the Governing Board and Treasurer's report**

5:00 **Introduction of ESA President, Susan Weller**

5:05 **Announcement of virtual Branch meeting and meeting in Vancouver, BC in 2018**

5:10 **International Branch Social**

Organized Meeting: IOBC Business Meeting and Mixer

Meeting Room 710/712 (Convention Center)

Moderator and Organizer: Jim Nechols, Kansas State Univ., Manhattan, KS

4:00 **Welcoming Remarks**

4:10 **Business meeting**

4:45 **Announcements**

5:00 **Presentation of IOBC awards**

5:10 **Distinguished scientist presentation**

5:35 **Ph.D. awardee presentation**

6:00 **President's comments**

6:30 **IOBC mixer**

10-min: MUVE, Vector Behavior and Physiology

Meeting Room 403 (Convention Center)

Moderators: Chloé Lahondère[1] and Mary Garvin[2], [1]Univ. of Washington, Seattle, WA, [2]Oberlin College, Oberlin, OH

3:30 **1677** Orchid pollination by snow mosquitoes. **Chloé Lahondère** (lahonder@uw.edu), Clement Vinauger, Ryo Okubo and Jeff Riffell, Univ. of Washington, Seattle, WA

3:40 **1678** Electropenetrography of mosquito, *Aedes aegypti*, feeding activity on humans: Detecting emf and R components. **Astri Wayadande** (a.wayadande@okstate.edu)[1], Elaine Backus[2] and Bruce Noden[1], [1]Oklahoma State Univ., Stillwater, OK, [2]USDA - ARS, Parlier, CA

3:50 **1679** Olfactory responses in the labellum of the malaria vector mosquito *Anopheles coluzzii*. **Mohamed Saveer Ahmed** (saveer.ahmed@gmail.com), R. Jason Pitts, Stephen Ferguson and Laurence Zwiebel, Vanderbilt Univ., Nashville, TN

4:00 **1680** Influence of volatile components of bird preen gland secretions on *Culex pipiens* feeding preference. **Mary Garvin** (mary.garvin@oberlin.edu), Maxwell Butler and Rebecca Whelan, Oberlin College, Oberlin, OH

4:10 **1681** Presentation withdrawn

4:20 **1682** The more you grow the more you know. Stoichiometric changes across the life cycle of *Aedes albopictus*. **James Valentine** (james.valentine@usm.edu), Shahid Karim and Donald Yee, Univ. of Southern Mississippi, Hattiesburg, MS

4:30 **1683** Competitive interactions of container mosquitoes at constant and fluctuating temperatures. **Nnaemeka Ezeakacha** (ezeakacha.fn@gmail.com), Pennsylvania State Univ., University Park, PA

4:40 **1684** Do container size and predators presence affect *Culex* (Diptera: Culicidae) oviposition preference? Jose Junior Santos[1], Jennifer A. Breaux[2] and **Daniel Albeny Simoes** (danielalbeny@unochapeco.edu.br)[1], [1]Community Univ. of Chapeco Region, Chapeco, Brazil, [2]Illinois State Univ., Normal, IL

10-min: PBT, Pollinators

Meeting Room 405 (Convention Center)

Moderators: Mark Carroll[1] and Alexandra Sébastien[2], [1]USDA - ARS, Tucson, AZ, [2]Univ. of British Columbia, Vancouver, BC, Canada

3:30 **1685** The impacts of commonly applied insecticides and fungicides on *Apis mellifera* nutrition and colony development. **Kirsten Traynor** (ktraynor@umd.edu) and Dennis vanEngelsdorp, Univ. of Maryland, College Park, MD

3:40 **1686** Disrupting da *destructor*: Insights into the feeding behavior of the honey bee ectoparasite *Varroa destructor*. **Noble Egekwu** (noble.egekwu@ars.usda.gov), Steven Cook, Francisco Posada and Daniel Sonenshine, USDA - ARS, Beltsville, MD

3:50 **1687** Analysis and conclusions from USEPA's neonicotinoid preliminary bee risk assessments. **Ryan Mroz** (mroz.ryan@epa.gov), Amy Blankinship, Frank Farruggia, Kristina Garber, Justin Housenger, Christopher Koper, Keith Sappington and Michael Wagman, U.S. Environmental Protection Agency, Washington, DC

4:00 **1688** The effects of insect growth regulators and an acaricide on honey bee (*Apis mellifera*) forager survival. **Adrian Fisher II** (solifuge9378@tamu.edu)[1], Juliana Rangel[1], Clint Hoffmann[2] and Bradley Fritz[1], [1]Texas A&M Univ., College Station, TX, [2]USDA - ARS, College Station, TX

4:10 **1689** Omnivory in bees. **Shawn Steffan** (steffan@entomology.wisc.edu)[1], Yoshito Chikaraishi[2], Prarthana Dharampal[3], Bryan N. Danforth[4], Hannah Gaines-Day[3] and Yuko Takizawa[2], [1]USDA - ARS, Madison, WI, [2]Hokkaido Univ., Sapporo, Japan, [3]Univ. of Wisconsin, Madison, WI, [4]Cornell Univ., Ithaca, NY

4:20 **1690** Chemical compounds that elicit hygienic behavior in the honey bee *Apis mellifera*. **Kaira Wagoner** (kmwagone@uncg.edu) and Olav Rueppell, Univ. of North Carolina, Greensboro, NC

4:30 **1691** Effects of long-term chronic exposure to a relatively new neurotoxic pesticide, flupyradifurone, on honey bees (*Apis mellifera*). **Simone Tosi** (tosi.biology@gmail.com)[1], James C. Nieh[1], Annely Brandt[2], Monica Colli[3], Julie Fourrier[4], Herve Giffard[5], Javier Hernández-López[6], Geoffrey Williams[7] and Noa Simon-Delso[8], [1]Univ. of California, La Jolla, CA, [2]LLH – Bee Institute, Kirchhain, Germany, [3]Biotecnologie BT, Todi (PG), Italy, [4]L'institut Claude Bourgelat, Marcy l'Etoile, France, [5]Testapi SARL, Gennes, France, [6]Karl-Franzens-Univ., Graz, Austria, [7]Auburn Univ., Auburn, AL, [8]Beekeeping Research Center and Information, Louvain la Neuve, Belgium

4:40 **1692** The effects of neonicotinoid-contaminated food stores on honey bee queens during dearth. **Mark Carroll** (mark.carroll@ars.usda.gov) and Nicholas Brown, USDA - ARS, Tucson, AZ

4:50 **1693** Canada-wide survey of honey bees to correlate genotypes and proteotypes with phenotypes. **Alexandra Sébastien** (alexandra.sebastien12@gmail.com)[1], Renata Borba[1], Rob Currie[2], Leslie Eccles[3], Leonard Foster[1], Pierre Giovenazzo[4], Heather Higo[1], Shelley Hoover[5], Stephen Pernal[6], Amro Zayed[7] and Michael Peirson[6], [1]Univ. of British Columbia, Vancouver, BC, Canada, [2]Univ. of Manitoba, Winnipeg, MB, Canada, [3]Ontario Beekeepers' Association, Guelph, BC, Canada, [4]Univ. Laval, Québec City, QC, Canada, [5]Univ. of British Columbia, Lethbridge, AB, Canada, [6]Agriculture and Agri-Food Canada, Beaverlodge, AB, Canada, [7]York Univ., Toronto, ON, Canada

Tuesday, November 7, 2017 • EVENING

Student Awards Ceremony

Four Seasons Ballroom (Convention Center)

Moderator and Organizer: Alix Whitener[1] and Casey Parker[2], [1]Washington State Univ., Wenatchee, WA, [2]Univ. of Florida, Vero Beach

6:30 PM - 8:00 PM

Organized Meeting: IUSSI North American Section Business Meeting

Meeting Room 504 (Convention Center)

Moderators and Organizers: Olav Rueppell[1], Jennifer M. Jandt[2] and James C. Nieh[3], [1]Univ. of North Carolina, Greensboro, NC, [2]Univ. of Otago, Dunedin, New Zealand, [3]Univ. of California, La Jolla, CA

8:00 **Welcoming Remarks**

8:15 **Business Meeting**

9:45 **Concluding Remarks**

Organized Meeting: Korean Young Entomologists (KYE)

Meeting Room 709 (Convention Center)

Moderators and Organizers: Donghun Kim[1] and June-Sun Yoon[2], [1]Kansas State Univ., Manhattan, KS, [2]Univ. of Kentucky, Lexington, KY

8:00 **Welcoming Remarks**

8:05 **1694** Pollinator robot inspired by structure and behavior of *Osmia* bees. **Yong-Lak Park** (yopark@mail.wvu.edu), West Virginia Univ., Morgantown, WV

8:20 **1695** Two acetylcholinesterases in insects and their multiple physiological functions. **Young Ho Kim** (yhkim05@knu.ac.kr), Kyungpook National Univ., Sangju, South Korea

8:35 **1696** Comparison of acaricidal and repellent activity of plant essential oil-derived compounds against two-spotted spider mite, *Tetranychus urticae*. **Jun-hyung Tak** (saturnpg7@yahoo.com)[1] and Murray B. Isman[2], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of British Columbia, Vancouver, BC, Canada

8:50 **1697** Molecular phylogeny and long elytra evolution of the subfamily Omaliinae (Coleoptera: Staphylinidae). Tae-Kyu Kim[1], **Jeong-Hun Song** (jhsong0817@gmail.com)[2] and Kee-Jeong Ahn[2], [1]National Research Institute of Health, Cheongju, South Korea, [2]Chungnam National Univ., Daejeon, South Korea

9:05 **Break**

9:15 **1698** Current status of fruit vegetable Smart Farm in Korea. **Young-Gyun Park** (insect1141@snu.ac.kr), Sunghoon Baek, Jae Seong Im, Min-Jung Kim and Joon-Ho Lee, Seoul National Univ., Seoul, South Korea

9:30 **1699** Population genetic structure of *Bemisia tabaci* (Hemiptera: Aleyrodidae) in South Korea by using eight microsatellite markers. **Yujeong Park** (bravohpark@snu.ac.kr) and Joon-Ho Lee, Seoul National Univ., Seoul, South Korea

9:45 **1700** Scale insects in persimmon orchards of Korea. **Hyeon Jeong An** (dksguswjd0413@naver.com)[1], Mun Gi Jung[1], Jeong Eun Kim[1], Janghoon Song[2] and Dong Woon Lee[1], [1]Kyungpook National Univ., Sangju, South Korea, [2]National Institute of Horticultural and Herbal Science, Naju, South Korea

10:00 **1701** Distribution of black pine bast scale, *Matsucoccus thunbergianae*, in Korea. **Young Jun Kim** (kjeqaz6715@naver.com)[1], Mun Gi Jung[1], Dong Su Lee[2] and Dong Woon Lee[1], [1]Kyungpook National Univ., Sangju, South Korea, [2]Korea Forestry Research Institute, Jinju, South Korea

10:15 **1702** RNA interference in insects: Biology, mechanism, and applications. **June-Sun Yoon** (june.yoon@uky.edu), Univ. of Kentucky, Lexington, KY

10:30 **Concluding Remarks**

Organized Meeting: North American Dipterists Society (NADS) Meeting

Meeting Room 505 (Convention Center)

Moderator and Organizer: Torsten Dikow, Smithsonian Institution, Washington, DC

8:00 **Welcoming Remarks**

8:05 **1703** Children of Dunes: Revision of sand-dwelling flies belonging to *Parathalassius* Mik (Diptera: Dolichopodidae: Parathalassiinae). **Jeffrey Cumming** (jeff.cumming@agr.gc.ca) and Scott Brooks, Agriculture and Agri-Food Canada, Ottawa, ON, Canada

8:20 **1704** Revisionary studies of Nearctic Dixidae: The *Dixa rudis* and *D. fusca* species groups. **John Moulton** (jmoulton@utk.edu), Univ. of Tennessee, Knoxville, TN

8:35 **1705** Taxonomic revision of the Oriental mydas-fly genus *Cacatuopyga* Papavero and Wilcox, 1974 (Diptera: Mydidae). **Even Dankowicz** (danko@brandeis.edu)[1] and Torsten Dikow[2], [1]Brandeis Univ., Waltham, MA, [2]Smithsonian Institution, Washington, DC

8:50 **SP1706** Systematics of assassin flies in the subfamily Dioctriinae (Diptera: Asilidae). **Chris Cohen** (myelaphus@gmail.com) and Michael Brewer, East Carolina Univ., Greenville, NC

9:00 **Discussion**

Organized Meeting: Overseas Chinese Entomologist Association (OCEA): Progress Report and Student Competition in 2017

Meeting Room 503 (Convention Center)

Moderator and Organizer: Jerry Zhu, USDA - ARS, Lincoln, NE

8:00 **Welcoming Remarks**

8:05 **Report of 2017 Summer Forum by OCEA and IOZ, Chinese Academy of Sciences**

8:25 **OCEA highlights of the year 2017**

8:55 **OCEA financial report**

9:10 **Student competition award seminar**

9:25 **Member faculty lecture**

9:45 **Election of OCEA officers and member activities**

10:00 **Concluding Remarks**

Organized Meeting: Society of Overseas Nepalese Entomologists Meeting

Meeting Room 707 (Convention Center)

Moderators and Organizers: Sandipa Gautam[1], Jhalendra Rijal[2] and Kabita Kharel[3], [1]Kearney Agricultural Sciences Center, Parlier, CA, [2]Univ. of California Cooperative Extension, Modesto, CA, [3]Purdue Univ., West Lafayette, IN

8:00 **Welcoming Remarks**

8:05 **Introductory Remarks**

8:10 **Presentation by Dr. Luc Leblanc**

8:30 **2-3 minute student presentations**

9:00 **Break**

9:10 **SONE Business meeting**

9:25 **Panel Discussion**

9:55 **Concluding Remarks**

Organized Meeting: The Coleopterists Society Annual General Meeting

Meeting Room 607 (Convention Center)

Moderator and Organizer: Derek Sikes, Univ. of Alaska, Fairbanks, AK

8:00 **Introductory Remarks**

8:05 **1707** Conversations with the dead: Old trails lead to new discoveries. **Maxwell Barclay** (m.barclay@nhm.ac.uk), The Natural History Museum, London, United Kingdom

8:50 **Question and Answer**

9:05 **Necrology**

9:10 **New Members**

9:15 **Approval of 2016 AGM minutes**

9:20 **Executive Council Changes**

9:25 **Editor's Report**

9:30 **Treasurer's Report**

9:35 **President's Report**

9:40 **Awards**

9:45 **Announcements**

9:50 **Future Meetings**

Wednesday, November 8, 2017 • POSTERS

Poster: MUVE, Behavior and Ecology

Mile High Ballroom (Convention Center)

D3429 Maximizing feeding efficiency in colony mosquitoes. **Felicia Vazquez** (fvasquez423@gmail.com), Megan Keniry and Christopher Vitek, Univ. of Texas, Edinburg, TX

D3430 A simplified approach to matching chemicals to chemosensory receptors in *Drosophila melanogaster*. **Amanda Smith** (smith014@highpoint.edu) and Jackson Sparks, High Point Univ., High Point, NC

D3431 Sensory integration in the disease vector mosquito *Aedes aegypti*. **Clement Vinauger** (vinauger@uw.edu)[1], Lauren Locke[1], Kennedy Tobin[1], Michael Dickinson[2] and Jeff Riffell[1], [1]Univ. of Washington, Seattle, WA, [2]California Institute of Technology, Pasadena, CA

D3432 Local environment impacts on the dispersal and genetic structure of cockroaches and microbes. **Xueyang Fan** (xf24@njit.edu), New Jersey Institute of Technology, Newark, NJ

D3433 Flooding events and mosquito activity in Appalachia. **Eric J. Dotseth** (eric.j.dotseth@wv.gov)[1], Jessy Blankenship[2] and Aida Jiménez-Esquilín[2], [1]West Virginia Dept. of Health and Human Resources, Charleston, WV, [2]Univ. of Charleston, Charleston, WV

D3434 Detection of *Chikungunya*-, *Dengue*-, and *Zik*a viruses in mosquitoes collected in Haiti, 2016. **Sarah White** (sek0005@epi.ufl.edu)[1], John Lednicky[1], James Dunford[2], Bernard Okech[1] and J. Glenn Morris Jr.[1], [1]Univ. of Florida, Gainesville, FL, [2]Navy and Marine Corps Public Health Center, Portsmouth, VA

D3435 Spatial and temporal patterns of *Aedes albopictus* and other container mosquitoes across Mississippi. **Catherine Dean** (catherine.dean@usm.edu)[1], J. Hunter Deerman[1], Jerome Goddard[2], Gail Moraru[2], Wendy Varnado[3] and Donald Yee[1], [1]Univ. of Southern Mississippi, Hattiesburg, MS, [2]Mississippi State Univ., Mississippi State, MS, [3]Mississippi Dept. of Health, Jackson, MS

D3436 Presentation withdrawn

D3437 Trap to capture and death of culícidos. **Héctor Parra** (hparra@uis.edu.co), Jonny Duque and Maria Vidal, Univ. Industrial de Santander, Bucaramanga, Colombia

D3438 How do nutrients affect *Aedes aegypti* and Zika infection in neighborhoods in San Juan, Puerto Rico? **Donald Yee** (donald.yee@usm.edu)[1], James Deerman[1], Rebeca DeJesus Crespo[2], Autumn Oczkowski[3], Susan Yee[2] and Fengwei Bai[1], [1]Univ. of Southern Mississippi, Hattiesburg, MS, [2]U.S. Environmental Protection Agency, Gulf Breeze, FL, [3]U.S. Environmental Protection Agency, Narragansett, RI

D3439 Arthropod diversity on urban college campuses. Jae Bradley, Molly Helie and **Roberta S. Engel** (rengel@ndm.edu), Notre Dame of Maryland Univ., Baltimore, MD

D3440 Questing platform selection by the ixodid ticks *Rhipicephalus sanguineus* and *Amblyomma americanum*. Miel Johnson[1], **Kenwyn Cradock** (kenwyn.cradock@enmu.edu)[1] and Marvin Lutnesky[2], [1]Eastern New Mexico Univ., Portales, NM, [2]Texas A&M Univ., San Antonio, TX

D3441 The effect of photoperiod on diapause in the blow fly, *Calliphora vicina* (Robineau-Desvoidy). **Stephanie Marino** (stephanie.marino@jjay.cuny.edu) and Jennifer Rosati, John Jay College of Criminal Justice, New York, NY

D3442 Laboratory studies on oviposition preference of *Toxorhynchites splendens* in the presence of conspecific and *Aedes aegypti* larvae. **Siriporn Phasomkusolsil** (siripornp@afrims.org), Nantaporn Monkanna, Kanchana Pantuwatana, Jaruwan Tawong, Yossasin Kertmanee, Sakon Khaosanorh, Elizabeth Wanja and Silas Davidson, Armed Forces Research Institute of Medical Sciences, Bangkok, Thailand

D3443 Oviposition preference of *Toxorhynchites splendens* (Diptera: Culicidae) on the larval and pupal rearing water of *Aedes aegypti* and *Anopheles dirus.* **Nantaporn Monkanna** (nantapornm@afrims.org), Siriporn Phasomkusolsil, Kanchana Pantuwatana, Jaruwan Tawong, Yossasin Kertmanee, Sakon Khaosanorh, Elizabeth Wanja and Silas Davidson, Armed Forces Research Institute of Medical Sciences, Bangkok, Thailand

D3444 A medieval forensic entomology case study. **James Willett** (jrw023@shsu.edu) and Sibyl Bucheli, Sam Houston State Univ., Huntsville, TX

D3445 Entomology vs. other sciences. **Siavash Taravati** (staravati@ucanr.edu), Univ. of California, Alhambra, CA

D3446 Local malaria elimination: A historical perspective from Palestine 100 years ago informs the current way forward in sub-Saharan Africa. **Anton Alexander** (antonlalexander@aol.com)[1] and Florence Dunkel[2], [1]Supreme Court of England (Retired), London, United Kingdom, [2]Montana State Univ., Bozeman, MT

D3447 New principles of local malaria elimination focuses on the role of the entomologist. **Branden Brelsford** (branden.brelsford2@gmail.com)[1], Florence Dunkel[1] and Anton Alexander[2], [1]Montana State Univ., Bozeman, MT, [2]Supreme Court of England (Retired), London, United Kingdom

D3448 Windborne migration of Sahelian insects. **Laura Verú** (laura.veru@nih.gov)[1], Jenna Florio[1], Alpha Yaro[2], Adama Dao[2], Moussa Diallo[2], Diana L. Huestis[1], Samake Djibril[2], Charles Bartlett[3], Asha Krishna[1], Jason Chapman[4], Don Reynolds[5], Maria Lourdes Chamorro[6], Elijah Talamas[7] and Tovi Lehmann[1], [1]National Institutes of Health, Rockville, MD, [2]International Center for Excellence in Research, Bamako, Mali, [3]Univ. of Delaware, Newark, DE, [4]Univ. of Exeter, Penryn, United Kingdom, [5]Univ. of Greenwich, Chatham, United Kingdom, [6]USDA - ARS, Washington, DC, [7]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

Poster: MUVE, Genetics and Morphology

Mile High Ballroom (Convention Center)

D3449 Presentation withdrawn

D3450 Using eDNA to detect mosquito larvae. **Joshua Jacobson** (jjacobson@co.clackamas.or.us) and George Peck, Clackamas County Vector Control District, Oregon City, OR

D3451 PCR detection and DNA sequence analysis of *Wolbachia* endosymbionts in mosquitoes and heartworms using the *gyrA* gene. **John Whitlock** (jwhitlock@hccfl.edu) and Jennifer Bess, Hillsborough Community College, Tampa, FL

D3452 High-resolution melt (HRM) analysis for detection of SNPs associated with acaricide resistance in the southern cattle fever tick, *Rhipicephalus microplus*. **Jason Tidwell** (jason.tidwell@ars.usda.gov)[1], Guilherme Klafke[1], Robert John Miller[1] and Adalberto A. Pérez de León[2], [1]USDA - ARS, Edinburg, TX, [2]USDA - ARS, Kerrville, TX

D3453 Molecular identification of *Deinocerites atlanticus* (Adames, 1971) (Diptera: Culicidae) using DNA barcode. **Angie Toro** (angiecantillo09@gmail.com)[1] and Richard Hoyos[2], [1]Univ. de Pamplona, Norte de Santander, Colombia, [2]Univ. del Sinu, Montería, Colombia

D3454 Genetic diversity of *Cryptotermes* and *Procryptotermes* termites (Isoptera: Kalotermitidae). **Allen Szalanski** (aszalan@uark.edu)[1], Rudolf Scheffrahn[2], James Austin[3] and Clinton E. Trammel[1], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Florida, Fort Lauderdale, FL, [3]BASF Corporation, Research Triangle Park, NC

D3455 Presentation withdrawn

D3456 First steps: Clearing and slide mounting protocol for dipteran larvae identification using potassium hydroxide. **Gregory Nigoghosian** (gnigogho@purdue.edu), Lauren Weidner and Trevor Stamper, Purdue Univ., West Lafayette, IN

D3457 Variations in palpal ornamentation of adult female *Anopheles fluviatilis* (Diptera: Culicidae) species T and U. **Gunjan Sharma** (guunjan.sharma@gmail.com) and Om Singh, National Institute of Malaria Research, New Delhi, India

D3458 Transcriptomic response of Spiroplasma to parasitic wasp attack in *Drosophila melanogaster*. **Victor Higareda-Alvear** (vm.higareda@gmail.com)[1], Esperanza Martínez-Romero[1] and Mariana Mateos[2], [1]Univ. Nacional Autónoma de México, Cuernavaca, Mexico, [2]Texas A&M Univ., College Station, TX

D3459 Diversity of bacteria associated with the venom gland of the scorpion *Vaejovis smithi*. **Tonalli García-Santibañez** (tonalli.nt@gmail.com), Esperanza Martínez-Romero and Mónica Rosenblueth, Univ. Nacional Autónoma de México, Cuernavaca, Mexico

Poster: PBT, Insecticides and Other Control

Mile High Ballroom (Convention Center)

D3460 Physiological status of *Drosophila suzukii* affects response to traps. **Jessica Wong** (jessicawong2420@gmail.com)[1], Anna Wallingford[2], Gregory Loeb[2] and Jana Lee[1], [1]USDA - ARS, Corvallis, OR, [2]Cornell Univ., Geneva, NY

D3461 Germline genome editing in the spotted wing drosophila, *Drosophila suzukii*. **William R. Reid** (wrreid@ncsu.edu), Fang Li and Maxwell Scott, North Carolina State Univ., Raleigh, NC

D3462 Use of simulated aerial application to evaluate foliar insecticides for control of pyrethroid resistant western corn rootworms. **Dariane Souza** (dariane_lyra@hotmail.com)[1], Bruno Vieira[2], Bradley Fritz[3,4], Wesley Hoffmann[3,4], Julie Peterson[2], Greg Kruger[2] and Lance J. Meinke[1], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, North Platte, NE, [3]USDA - ARS, College Station, TX, [4]Texas A&M Univ., College Station, TX

D3463 The loss-of-function analyses of RNAi pathway genes in western corn rootworm adults. **Ke Wu** (kewu@ufl.edu)[1], Carolina Camargo[1], Elane Fishilevich[2], Kenneth Narva[2], Xiuping Chen[3], Caitlin Taylor[1] and Blair Siegfried[1], [1]Univ. of Florida, Gainesville, FL, [2]Dow AgroSciences, Indianapolis, IN, [3]Chinese Academy of Agricultural Sciences, Beijing, China

D3464 Baseline susceptibility of a northern corn rootworm, *Diabrotica barberi* Smith & Lawrence, laboratory strain to Cry3 Bt. **Adriano Pereira** (aelias374@yahoo.com.br)[1], Bryan French[2], Chad Nielson[2], Dalton Ludwick[1], Man Huynh[3], Thomas Coudron[4] and Bruce Hibbard[4], [1]Univ. of Missouri, Columbia, MO, [2]USDA - ARS, Brookings, SD, [3]Can Tho Univ., Can Tho, Vietnam, [4]USDA - ARS, Columbia, MO

D3465 Can pyramids delay resistance to Bt crops? **Yves Carriere** (ycarrier@ag.arizona.edu)[1], Jeffrey A. Fabrick[2] and Bruce Tabashnik[1], [1]Univ. of Arizona, Tucson, AZ, [2]USDA - ARS, Maricopa, AZ

D3466 Mapping of Bt Cry2Ab resistance gene in the cabbage looper, *Trichoplusia ni*. **Xiaowei Yang** (xy322@cornell.edu)[1], Wenbo Chen[2], Zhangjun Fei[3] and Ping Wang[1], [1]Cornell Univ., Geneva, NY, [2]Boyce Thompson Institute for Plant Research, Ithaca, NY, [3]Cornell Univ., Ithaca, NY

D3467 Gene expression response of *Helicoverpa zea* to infection by *Bacillus thuringiensis israelensis* or *Bt kurstaki*. **Sue Hum-Musser** (sm-hum-musser@wiu.edu)[1], Ruchi Ojha[1], Mobayode Osatuyi[1], Heiko Vogel[2] and Richard O. Musser[1], [1]Western Illinois Univ., Macomb, IL, [2]Max Planck Institute for Chemical Ecology, Jena, Germany

D3468 Compatibility between chemical and biological insecticides based on *Bacillus thuringiensis* Berliner in the control of *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae). Valéria Lucas de Laurentis[1], **Alessandra Marieli Vacari** (amvacari@gmail.com)[2], Lauany Santos[3], Nathalia Santos[4], Dagmara Ramalho[4], Vanessa Fabiola Pereira Carvalho[1] and Sergio De Bortoli[1], [1]Univ. Estadual Paulista, Jaboticabal, Brazil, [2]Univ. de Franca, Franca, Brazil, [3]Francisco Maeda, Ituverava, Brazil, [4]Univ. de São Paulo, Ribeirão Preto, Brazil

D3469 Characterization of resistance to diamide insecticides in *Spodoptera frugiperda* (Lepidoptera: Noctuidae) in Brazil. **Anderson Bolzan** (ander_bolzan@hotmail.com), Fernando Padovez, Ewerton Lira, Fernando Amaral, Rubens Kanno and Celso Omoto, Univ. de São Paulo, Piracicaba, Brazil

D3470 Newly established cell lines from selected tissues of *Spodoptera frugiperda*. **Tamra Reall** (trfy9f@mail.missouri.edu)[1], Cynthia Goodman[1], Joseph Ringbauer[1], Sven Geibel[2] and David Stanley[1], [1]USDA - ARS, Columbia, MO, [2]Bayer AG, Monheim, Germany

D3471 Characterization of cell lines established from specific tissues of larval *Spodoptera frugierda* and *S. eridania*. **Hongwei Zhang** (hzz78@mail.missouri.edu)[1], Yaofa Li[2], Tamra Reall[3], Cynthia Goodman[3], Steve Saathoff[3], Joseph Ringbauer[3] and David Stanley[3], [1]Univ. of Missouri, Columbia, MO, [2]Hebei Academy of Agricultural and Forestry Sciences, Baoding, China, [3]USDA - ARS, Columbia, MO

D3472 Flupyradifurone is selective to the egg's parasitoid *Trichogramma pretiosum*. **Fernando Iost Filho** (fernandohiost@gmail.com), Ana Clara Paiva and Pedro Yamamoto, Univ. de São Paulo, Piracicaba, Brazil

D3473 Persistence of insecticides on the parasitoid *Trichogramma pretiosum*. **Ana Clara Paiva** (anaclara-r@hotmail.com), Fernando Iost Filho, Vitor Beloti and Pedro Yamamoto, Univ. de São Paulo, Piracicaba, Brazil

D3474 Inert dusts water activity: The overlooked critical factor in efficacy assessment. **Kouame Yao** (kdyao@ksu.edu), Kansas State Univ., Manhattan, KS

D3475 Acute toxicity of botanochemicals ginger oil and thymol against eggplant leaf beetle, *Epilachana vigintioctopunctata* Fab. **Ayyasamy Regupathy** (ayyasamy.regu@gmail.com) and Sakthivel S, Annamalai Univ., Chidambaram, India

D3476 Mating disruption of two *Grapholita* species simultaneously in apple orchards. **Yonggyun Kim** (hosanna@anu.ac.kr), Andong National Univ., Andong, South Korea

D3477 Selection and inheritance of Cry1Ac resistance in eggplant fruit and shoot borer (*Leucinodes orbonalis*). Dattatray Shirale, Mangesh Patil, Bharat Char and **Srinivas Parimi** (srinivas.parimi@mahyco.com), Maharashtra Hybrid Seeds Co. Pvt. Ltd, Jalna, India

D3478 Presentation withdrawn

D3479 Susceptibility of the lacewing *Chrysoperla externa* (HAGEN) to lambda-cyhalothrin with behavior and predatory response. Rene Luna[1], Luziani Bestete[1], **Jorge Torres** (jorge.torres@ufrpe.br)[2] and Christian Silva-Torres[1], [1]Univ. Federal Rural de Pernambuco, Recife, Brazil, [2]Univ. Federal Rural de Pernambuco, Camaragibe, Brazil

D3480 cDNA library construction of *Aphis gossypii* for RNAi application. **Hye-Ri Kwon** (hr0221@cnu.ac.kr), Heon Yoon, Yong-Man Yu and Young Nam Youn, Chungnam National Univ., Daejeon, South Korea

D3481 Vial and diet bioassays for monitoring resistance levels in tarnished plant bug. **Maribel Portilla** (maribel.portilla@ars.usda.gov) and Randall Luttrell, USDA - ARS, Stoneville, MS

D3482 Olfactory responses of the meadow spittlebug, *Philaenus spumarius*, vector of *Xylella fastidiosa* subsp. *pauca*, to two essential oils. Sonia Ganassi[1], Marco Pistillo[2], Carmela Di Domenico[1], Giacinto Germinara[2] and **Antonio De Cristofaro** (decrist@unimol.it)[1], [1]Univ. of Molise, Campobasso, Italy, [2]Univ. of Foggia, Foggia, Italy

D3483 Functional analysis of key ATP-binding cassette (ABC) transporter genes in the western corn rootworm, *Diabrotica virgifera virgifera*: Potential for species-specific pest control. **Folukemi Adedipe** (feadedip@ncsu.edu) and Marcé Lorenzen, North Carolina State Univ., Raleigh, NC

D3484 Transcriptome analysis and RNAi responses in the small hive beetle. **Steven Reyna** (smreyna@ncsu.edu) and Marcé Lorenzen, North Carolina State Univ., Raleigh, NC

D3485 Discriminating lethal doses and insecticide resistance status of *Aedes albopictus* Skuse (Diptera: Culicidae) in Penang Island, Malaysia. **Junaid Rahim** (junaidrahim47@yahoo.com) and Abu Hassan Ahmad, Univ. Sains Malaysia, Penang, Malaysia

Poster: P-IE, Behavior and Ecology 2

Mile High Ballroom (Convention Center)

D3486 Different questing behaviors of the blacklegged tick on different climbing substrates. **Jonathan Hernandez** (alfred.hernandez@sbcglobal.net), Mackenzie Tietjen and Raul F. Medina, Texas A&M Univ., College Station, TX

D3487 Preliminary assessment of arthropod pests of teff, *Eragrostis tef,* in Nevada. **Joy Newton** (newtonj@unce.unr.edu)[1] and Jay Davison[2], [1]Univ. of Nevada, Yerington, NV, [2]Univ. of Nevada, Fallon, NV

D3488 Drivers of *Sirex noctilio* woodwasp outbreak dynamics in southern South America. **María Victoria Lantschner** (lantschner.v@inta.gob.ar)[1], Brian Aukema[2] and Juan Corley[1], [1]INTA - CONICET, Bariloche, Argentina, [2]Univ. of Minnesota, St. Paul, MN

D3489 Response of a differential panel of wheat varieties to geographically diverse Hessian fly populations. Steven Odubiyi[1], Esraa A. Alalwan[2], Michael Pumphrey[2] and **Nilsa A. Bosque-Pérez** (nbosque@uidaho.edu)[1], [1]Univ. of Idaho, Moscow, ID, [2]Washington State Univ., Pullman, WA

D3490 Probing behavior of *Dichelops furcatus* (F.) (Heteroptera: Pentatomidae) on wheat plants characterized by electropenetrography (EPG) and histological studies. Tiago Lucini[1] and **Antônio Panizzi** (antonio.panizzi@embrapa.br)[2], [1]Federal Univ. of Parana, Curitiba, Brazil, [2]Embrapa National Wheat Research Center, Passo Fundo, Brazil

D3491 Reproduction and emergence of the twig-girdler, *Oncideres cingulata*, relative to host tissue nutrient content. **Bryan Coppedge** (bryan.coppedge@tulsacc.edu), Tulsa Community College, Tulsa, OK

D3492 Habitat suitability modelling of an endemic alpine arthropod species in Hawai'i. **Nathan Stephenson** (nathanms@hawaii.edu), Jesse A. Eiben, Ryan Perroy and Frederick Klasner, Univ. of Hawai'i, Hilo, HI

D3493 Research on wheat-hessian fly interaction at Fayetteville State University. **Lieceng Zhu** (lzhu@uncfsu.edu), Fayetteville State Univ., Fayetteville, NC

D3494 Impact of *Abrostola asclepiadis* and plant competition on invasive swallow-worts (*Vincetoxicum* spp.). **Lindsey Milbrath** (lindsey.milbrath@ars.usda.gov)[1], Jeromy Biazzo[1], Antonio DiTommaso[2] and Scott Morris[2], [1]USDA - ARS, Ithaca, NY, [2]Cornell Univ., Ithaca, NY

D3495 Behavioral field observations of monarchs (*Danaus plexippus*) in the Northern Great Plains. **Katherine Kral** (katherine.kral@ndsu.edu), Jason Harmon, Ryan Limb and Torre Hovick, North Dakota State Univ., Fargo, ND

D3496 Grasshopper (Orthoptera: Acrididae) egg-pods: A unique adaptation to survive in extreme environmental conditions. **Alexandre Latchininsky** (latchini@uwyo.edu), Univ. of Wyoming, Laramie, WY

D3497 Minimal pruning and reduced plant protection promote predatory mites in an experimental vineyard. **Theresa Pennington** (mrstheresapennington@gmail.com)[1], Christoph Hoffmann[2] and Martin Entling[1], [1]Univ. of Koblenz, Landau, Germany, [2]Julius Kühn-Institut, Siebeldingen, Germany

D3498 *Anoplophora glabripennis* (Coleoptera: Cerambycidae) behaviors involved in finding and competing for a mate. **Melody A. Keena** (mkeena@fs.fed.us) and Vicente Sánchez, USDA - Forest Service, Hamden, CT

D3499 Exploration of climatic niche shift in North American gypsy moth (*Lymantria dispar*) populations. **Amy Morey** (morey041@umn.edu)[1] and Robert Venette[2], [1]Univ. of Minnesota, St. Paul, MN, [2]USDA - Forest Service, St. Paul, MN

D3500 Performance of *Dichelops melacanthus* (Dallas) (Hemiptera: Pentatomidae) in conventional and Bt corn genotypes. **Nádia Bueno** (nadia.bueno@gmail.com)[1], Edson Baldin[1], Vinícius Canassa[1] and Leandro Ribeiro[2], [1]Univ. Estadual Paulista, Botucatu, Brazil, [2]Agricultural Research and Rural Extension Company of Santa Catarina, Chapecó, Brazil

D3501 The importance of time when characterizing temperature effects on aphid fecundity. **Aleix Valls** (aleix.valls@ndsu.edu) and Jason Harmon, North Dakota State Univ., Fargo, ND

D3502 Preliminary survey of insects present in commercial melon fields in Northern California. **Amber Vinchesi** (acvinchesi@ucanr.edu), Univ. of California Cooperative Extension, Colusa, CA

D3503 Behavioral responses of two common insect pests to volatile metabolites of *Dickeya dianthicola*. **Jonas Insinga** (jki@insinga.com) and Andrei Alyokhin, Univ. of Maine, Orono, ME

D3504 Density-mediated leaf damage and yield loss of potato by *Liriomyza huidobrensis* (Blanchard) (Diptera: Agromyzidae). **Min Kwon** (mkwon@korea.kr), Juil Kim and Rameswor Maharjan, National Institute of Crop Science, Pyeongchang, South Korea

D3505 The unexpected invasion: Effects of invasives on the ant community. **Sara Alvarez** (lasarasota@ufl.edu), Univ. of Florida, Gainesville, FL

D3506 Natural history of two dominant *Camponotus* ants (Hymenoptera: Formicidae) in the Brazilian cerrado. Mariane U. V. Ronque[1], Vincent Fourcassié[2] and **Paulo S. Oliveira** (pso@unicamp.br)[1], [1]Univ. Estadual de Campinas, Campinas, Brazil, [2]Univ. de Toulouse III, Toulouse, France

D3507 Landscape and local influences on *Wasmannia auropunctata* abundance in restored tropical forests. **Ana Rubio** (anmrubio@ucsc.edu) and Andy Kulikowski, Univ. of California, Santa Cruz, CA

Poster: P-IE, Host Plant and Pathogen Interactions

Mile High Ballroom (Convention Center)

D3508 Host plant and winter survival affects sugarcane aphid overwintering. **Tavvs Alves** (alves011@umn.edu)[1], William Ahrens[1], Michael Brewer[1] and Norman Elliott[2], [1]Texas A&M Univ., Corpus Christi, TX, [2]USDA - ARS, Stillwater, OK

D3509 Impact of thrips and two-spotted spider mites on Texas cotton. **Abdul Hakeem** (ahakeem@vols.utk.edu)[1], Sarah Zukoff[2], Glen Ritchie[3], James Nechols[4], John Ruberson[4], Joe Krauska[5] and Megha Parajulee[1], [1]Texas A&M Univ., Lubbock, TX, [2]Kansas State Univ., Garden City, KS, [3]Texas Tech Univ., Lubbock, TX, [4]Kansas State Univ., Manhattan, KS, [5]Univ. of Missouri, Columbia, MO

D3510 Weedy borders influence diversity and abundance of beneficial insects in subtropical agroecosystems. **Alexis Racelis** (alexis.racelis@utrgv.edu)[1], Quentin Van Camp[2] and Pushpa Soti[1], [1]Univ. of Texas, Edinburg, TX, [2]Univ. Catholique de Louvain, Louvain-la-Neuve, Belgium

D3511 Evaluation of effects of the Asian citrus psyllid area-wide management program in Mexico. **J. Isabel López-Arroyo** (lopez.jose@inifap.gob.mx)[1], Edgardo Cortez-Mondaca[2], Juan J. Pacheco-Covarrubias[3], Ulises Díaz-Zorrilla[4], Gabriel Díaz-Padilla[5], Jesús Loera-Gallardo[6] and Pedro Robles-García[7], [1]Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias, General Terán, Mexico, [2]Campo Experimental Valle del Fuerte, Juan José Ríos, Mexico, [3]Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias, Obregon, Mexico, [4]Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias, Martínez de la Torre, Mexico, [5]Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias, Medellín de Bravo, , Mexico, [6]Campo Experimental Río Bravo, Río Bravo, Mexico, [7]SENASICA, Mexico City, Mexico

D3512 Incidence of '*Candidatus* Liberibacter asiaticus' in a Florida population of Asian citrus psyllid. **David Hall** (david.hall@ars.usda.gov), USDA - ARS, Fort Pierce, FL

D3513 Host selection behavior of the brown marmorated stink bug on selected vegetables and other host plants. **Beatrice Dingha** (bndingha@ncat.edu), Sushil Nyaupane, Melvin Mensah-Bonsu, Jennifer Rae Milligan and Louis Jackai, North Carolina A&T State Univ., Greensboro, NC

D3514 Development and fecundity performance of oriental fruit moth (Lepidoptera: Tortricidae) on different fruits. **Souvic Sarker** (souvicsarker08@gmail.com) and Un Taek Lim, Andong National Univ., Andong, South Korea

D3515 Diversification of Upper Midwest corn-soybean systems with cover crops. Timothy Sklenar, Seth Appelgate, **Andrew Lenssen** (alenssen@iastate.edu) and Sue Blodgett, Iowa State Univ., Ames, IA

D3516 An overview of drippy blight: An emergent insect-associated disease of red oaks. **Rachael Sitz** (rachael.sitz@colostate.edu), Jane Stewart and Whitney Cranshaw, Colorado State Univ., Fort Collins, CO

D3517 Phenology of the potato psyllid, *Bactericera cockerelli* (Hemiptera: Triozidae), and "*Candidatus* Liberibacter solanacearum" in commercial potato fields in Idaho. **Erik Wenninger** (erikw@uidaho.edu)[1], Amy Carroll[1], Jennifer Dahan[2], Alexander Karasev[2], Michael Thornton[3], Jeff Miller[4], Phillip Nolte[5], Nora Olsen[1] and William Price[2], [1]Univ. of Idaho, Kimberly, ID, [2]Univ. of Idaho, Moscow, ID, [3]Univ. of Idaho, Parma, ID, [4]Miller Research, LLC, Rupert, ID, [5]Univ. of Idaho, Idaho Falls, ID

D3518 Comparison of insect pests and aphid-borne plant viruses in fall-sown and spring-sown pea. **Jake Hennessey** (henn8441@vandals.uidaho.edu), Sanford Eigenbrode, Edward J. Bechinski, Kurtis Schroeder and Ying Wu, Univ. of Idaho, Moscow, ID

D3519 Presentation withdrawn

D3520 Relative importance of initial inoculum and transmission efficiency by aphid vectors in spread of potato virus Y. Andrew Galimberti[1], **Andrei Alyokhin** (alyokhin@maine.edu)[1] and HongChun Qu[2], [1]Univ. of Maine, Orono, ME, [2]Chongquing Univ. of Posts and Telecommunications, Chongquing, China

D3521 Drought stress modulates potato psyllid feeding behaviors associated with "*Candidatus* Liberibacter solanacearum" transmission. **Vamsi Nalam** (nalamvj@ipfw.edu)[1], Punya Nachappa[1] and Ada Szczepaniec[2], [1]Indiana Univ.-Purdue Univ., Fort Wayne, IN, [2]Texas A&M Univ., Amarillo, TX

D3522 Host preference and food consumption of the Asian citrus psyllid, *Diaphorina citri*, in non-citrus rutaceous species. **Gustavo Alves** (gralves@usp.br), Higor Pimpinato, José Parra and Pedro Yamamoto, Univ. de São Paulo, Piracicaba, Brazil

D3523 Probing behavior of the Asian citrus psyllid, *Diaphorina citri*, in curry leaf. **Vitor Beloti** (vitorbeloti@usp.br)[1], Gustavo Alves[1], Rafael Brandão Garcia[2], Marcelo Pedreira Miranda[2] and Pedro Yamamoto[1], [1]Univ. de São Paulo, Piracicaba, Brazil, [2]Fundo de Defesa da Citricultura, Araraquara, Brazil

D3524 Identifying potential receptors in *Peregrinus maidis*, the insect vector of *Maize mosaic rhabdovirus,* through high-throughput split ubiquitin membrane-based yeast two hybrid system (MbY2H). **Karen Alviar** (kbalviar@up.edu.ph)[1,2], Dorith Rotenberg[2] and Anna Whitfield[2], [1]Univ. of the Philippines, Los Banos, Philippines, [2]Kansas State Univ., Manhattan, KS

D3525 Screening for resistance to zebra chip in potato genotypes. Regina Cruzado[1], Mahnaz Rashidi[1], Nora Olsen[2], Erik Wenninger[2], Richard G. Novy[3], Nilsa A. Bosque-Pérez[4] and **Arash Rashed** (arashed@uidaho.edu)[1], [1]Univ. of Idaho, Aberdeen, ID, [2]Univ. of Idaho, Kimberly, ID, [3]USDA - ARS, Aberdeen, ID, [4]Univ. of Idaho, Moscow, ID

D3526 Metabolites changes in rice (9Y6H and 5AXR49) with nitrogen fertilizer and pest (*Nilaparvata lugens*) damage. **Jean Willy Nduwimana** (jeanwillynduwimana@yahoo.fr), Sun Ze, Fan Tao and Wang ManQun, Huazhong Agricultural Univ., Wuhan, China

D3527 Effects of an outbreaking specialist herbivore on the patch dynamics of the common paw-paw following amur honey suckle removal. **Rodrigo Mercader** (rodrigo.mercader@washburn.edu), Washburn Univ., Topeka, KS

D3528 Endophytic fungi and its associative role in resistance and tolerance of herbivorous pests in *Sorghum bicolor* and *Zea mays* via life-history and demography. **Leah Buchman** (lwb43@tamu.edu), Gregory Sword and Julio S. Bernal, Texas A&M Univ., College Station, TX

D3529 Multistate effort to understand aphid diversity and PVY spread in potatoes in the United States. Andrei Alyokhin[1], Sudep Bag[2], James Dill[3], James Dwyer[1], Kenneth E. Frost[2], Russell Groves[4], Silvia Rondon[2], Erik Wenninger[5], Doris Lagos-Kutz[6] and **Chris Benedict** (chrisbenedict@wsu.edu)[7], [1]Univ. of Maine, Orono, ME, [2]Oregon State Univ., Hermiston, OR, [3]Univ. of Maine, Presque Isle, ME, [4]Univ. of Wisconsin, Madison, WI, [5]Univ. of Idaho, Kimberly, ID, [6]USDA - ARS, Urbana, IL, [7]Washington State Univ., Bellingham, WA

D3530 Bacteria associated with Russian wheat aphid (*Diuraphis noxia*) enhance aphid virulence to wheat. **Emily Luna** (emily.peachey@colostate.edu)[1], Leon van Eck[1,2,3], Tony Campillo[1], Michelle Cilia[4,5], Jessica Metcalf[1], A. M. Botha[3], Margaret Weinroth[1], Theodore Thannhauser[4], Darryl Pappin[6], Ned Tisserat[1], Cris Argueso[1], Nora L. V. Lapitan[1], Paul Ode[1] and Jan Leach[1], [1]Colorado State Univ., Fort Collins, CO, [2]Univ. of Minnesota, St. Paul, MN, [3]Stellenbosch Univ., Stellenbosch, South Africa, [4]USDA - ARS, Ithaca, NY, [5]Cornell Univ., Ithaca, NY, [6]Cold Spring Harbor Laboratory, Cold Spring Harbor, NY

D3531 American grape berry moth (*Paralobesia viteana*) and noble rot, *Botrytis cinerea* - Some direction from study in European grape berry moth, *Lobesia botrana*. **Pragya Chalise** (pragya.chalise@gmail.com), Virginia Polytechnic Institute and State Univ., Blacksburg, VA

D3532 Light heterogeneity as a mechanism of phytochemical defense along a tropical mountain. **Andrea Glassmire** (glssmr33@gmail.com), Lora Richards, Casey Philbin, Christopher Jeffrey and Lee A. Dyer, Univ. of Nevada, Reno, NV

D3533 Antibiosis of rice genotypes to *Tibraca limbativentris* (Hemiptera: Pentatomidae). **André Cirilo Almeida** (andre_cirillo@hotmail.com)[1], Cássio Dierings[1], Débora Miranda[1], Flávio Jesus[1] and José Alexandre Barrigossi[2], [1]Instituto Federal Goiano, Urutaí, Brazil, [2]Embrapa Arroz e Feijão, Santo Antônio de Goiás, Brazil

D3534 Use of insect resistant soybean cultivars in IPM. **John All** (jall@uga.edu)[1], Zenglu Li[1], Wayne Parrott[1], Phillip Roberts[2], Roger Boerma[1] and Dean Kemp[1], [1]Univ. of Georgia, Athens, GA, [2]Univ. of Georgia, Tifton, GA

D3535 A circulative plant virus changes the anti-viral immune system of its aphid vector: Evidence from siRNA profiling. **Patricia Pinheiro** (patricia.pinheiro@embrapa.br)[1], Jennifer R. Wilson[2], Yi Xu[2], Yi Zheng[2], Ana Rita Rebelo[2], Somayeh Fattahalhosseini[2], Angela Kruse[2], Rogerio Santos Dos Silva[2], Yimin Xu[2], James Giovannoni[2], Zhangjun Fei[2], Stewart Gray[2,3] and Michelle (Cilia) Heck[2,3], [1]Embrapa Arroz e Feijão, Goiania, Brazil, [2]Cornell Univ., Ithaca, NY, [3]USDA - ARS, Ithaca, NY

Poster: P-IE, Insecticides and Other Control 2

Mile High Ballroom (Convention Center)

D3536 Six-year evaluation of systemic insecticides applied at one-, two-, and three-year intervals for emerald ash borer control. **Deborah McCullough** (mccullo6@msu.edu)[1], Therese Poland[2], Andrew Tluczek[1], James Wieferich[1], Andrea Anulewicz[3] and Nathan Siegert[4], [1]Michigan State Univ., East Lansing, MI, [2]USDA - Forest Service, Lansing, MI, [3]USDA - APHIS, Brighton, MI, [4]USDA - Forest Service, Durham, NH

D3537 Transovarial effects of insect growth regulators on *Bagrada hilaris* (Hemiptera: Pentatomidae). **Shimat V. Joseph** (shimatbug@gmail.com), Univ. of California, Salinas, CA

D3538 SmartStax PRO - Next generation technology for corn rootworm management. **Laura Campbell** (lacampbell@dow.com)[1], Kent Davies[2], Bradley Hopkins[2], Kevin Johnson[3], Miles Lepping[2], Dwain Rule[2], Nicholas Storer[2] and Jill Zeller[2], [1]Dow AgroSciences, Carbondale, IL, [2]Dow AgroSciences, Indianapolis, IN, [3]Dow AgroSciences, Danville, IL

D3539 Resistance of corn earworm (*Helicoverpa zea* (Boddie)) to pyrethroid insecticides in Virginia. **Katlyn Catron** (kcatron@vt.edu)[1], Sally Taylor[2] and Thomas Kuhar[1], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Virginia Polytechnic Institute and State Univ., Suffolk, VA

D3540 Quantifying sources of variability in neonicotinoid residue data for assessing risks to pollinators. **Ryan Mroz** (mroz.ryan@epa.gov), Amy Blankinship, Frank Farruggia, Kristina Garber, Christopher Koper, Keith Sappington and Michael Wagman, U.S. Environmental Protection Agency, Washington, DC

D3541 Developing insecticide resistance in the glassy-winged sharpshooter (*Homalodisca vitripennis* (Gemar)). **Richard Redak** (richard.redak@ucr.edu), Bradley White, Ming Li and Frank J. Byrne, Univ. of California, Riverside, CA

D3542 Comparative susceptibilities of different life stages of *Helicoverpa zea* and *Heliothis virescens* to various insecticides. **K. Clint Allen** (clint.allen@ars.usda.gov) and Nathan Little, USDA - ARS, Stoneville, MS

D3543 Pesticide risk tool: Reducing and reporting pesticide risks in IPM and sustainability initiatives. **Thomas Green** (ipmworks@ipminstitute.org), Daniel Skolnik, Ida Yu and Patrick Shannon-Hughes, IPM Institute of North America, Madison, WI

D3544 Comparison of trap types, colors, and placement for capturing cranberry weevil (Coleoptera: Curculionidae) adults in highbush blueberries. **Diego Silva** (diegobs182@yahoo.com.br)[1], Vera Kyryczenko-Roth[1], Hans Alborn[2] and Cesar Rodriguez[1], [1]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ, [2]USDA - ARS, Gainesville, FL

D3545 Spatially-explicit estimates of monarch butterfly (*Danaus plexippus*) population responses to insecticide spray drift exposure in an Iowa agroecosystem. **Tyler Grant** (tgrant@iastate.edu), Niranjana Krishnan and Steven Bradbury, Iowa State Univ., Ames, IA

D3546 A maize defensin active against maize ear insect and fungal pests. **Patrick Dowd** (patrick.dowd@ars.usda.gov) and Eric Johnson, USDA - ARS, Peoria, IL

D3547 Performance of Cry1A.105/Cry2Ab2-susceptible and -heterozygous genotypes of the fall armyworm in sequential feedings on non-Bt and Bt maize plant tissue. **Yiwan Zhou** (yiwan1021@163.com)[1], Ying Niu[1], Graham P. Head[2], Paula A. Price[2] and Fangneng Huang[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Monsanto Company, St. Louis, MO

D3548 Effect of geographical features on the efficacy of mating disruption technique in *Sesamia inferens* (Lepidoptera: Noctuidae) in sugarcane fields. **Youichi Kobori** (koboriy@affrc.go.jp)[1], Ken Takesaki[2], Takeshi Osawa[3] and Takuhiro Yamaguchi[2], [1]Japan International Research Center for Agricultural Sciences, Ishigaki, Japan, [2]Kagoshima Prefectural Government, Amami, Japan, [3]Institute for Agro-Environmental Sciences, Tsukuba, Japan

D3549 Effect of mating disruption start and stop time on chronobiology of the navel orangeworm, *Amyelois transitella* (Lepidoptera: Pyralidae). **Charles Burks** (charles.burks@ars.usda.gov)[1], Don Thomson[2] and Christeen Abbot-Hearn[3], [1]USDA - ARS, Parlier, CA, [2]Pacific Biocontrol Corporation, Calgary, AB, Canada, [3]Pacific Biocontrol Corporation, Kingsburg, CA

D3550 Arthropods observed in contact with *Helicoverpa armigera* Nucleopolyhedrovirus infected *Helicoverpa zea* in soybeans. **Joseph Black** (jblack@uaex.edu) and Gus Lorenz, Univ. of Arkansas, Lonoke, AR

D3551 Hot water treatment as a control measure of dry bulb mite, *Aceria tulipae* (Acari: Eriophyidae). **Ahmed Hammad** (ahmed7399@yahoo.com)[1], Azhari Abdelbagi[1], Azza Abbo[1], Elaziz Ishag[1] and Mark Laing[2], [1]Univ. of Khartoum, Khartoum, Sudan, [2]Univ. of KwaZulu-Natal, Pietermaritzburg, South Africa

D3552 Strategies to maintain and improve effectiveness insecticides frequently used to control spotted wing drosophila in blueberries. **Ashfaq Sial** (ashsial@uga.edu), Jamal Hunter, Brian Little and Craig Roubos, Univ. of Georgia, Athens, GA

D3553 Sublethal effects of Neotropical Annonaceae-derived extract and annonin-based commercial bioinsecticide on *Helicoverpa armigera* (Lepidoptera: Noctuidae). **Camila Souza** (souza_767@hotmail.com)[1], Edson Luiz Lopes Baldin[1], Leandro Prado Ribeiro[2], Ivana F. da Silva[1], Thais Lohine Braga dos Santos[1] and Jose Vendramim[3], [1]Univ. Estadual Paulista, Botucatu, Brazil, [2]Agricultural Research and Rural Extension Company of Santa Catarina, Chapecó, Brazil, [3]Univ. de São Paulo, Piracicaba, Brazil

D3554 Economic and environmentally-sound management of heliothines in Bt cotton using a systems-level approach with natural pesticides. **Blake Elkins** (blake.elkins@ars.usda.gov), Nathan Little, Maribel Portilla, K. Clint Allen, Katherine Parys and Omaththage Perera, USDA - ARS, Stoneville, MS

D3555 Management of soil insects in sweet potato in south Georgia. **Alton Sparks** (asparks@uga.edu) and David Riley, Univ. of Georgia, Tifton, GA

D3556 Spray coverage of a solid set canopy delivery system in grapes, raspberries, and blueberries. **Matt Grieshop** (grieshop@msu.edu), Paul Owen-Smith and Jacob Malsch, Michigan State Univ., East Lansing, MI

D3557 Evaluation of new proteins against resistant western corn rootworm populations. Brent Werner, Chitvan Khajuria and **Yong Yin** (yong.yin@monsanto.com), Monsanto Company, St. Louis, MO

D3558 Management of insects in ornamental nurseries with laser-guided variable-rate sprayer. **Heping Zhu** (heping.zhu@ars.usda.gov)[1], Robin Rosetta[2], Michael Reding[1], Christopher Ranger[1] and Luis A. Cañas[3], [1]USDA - ARS, Wooster, OH, [2]Oregon State Univ., Aurora, OR, [3]The Ohio State Univ., Wooster, OH

D3559 Field efficacy of *Bacillus thuringiensis var. galleriae* strain, SDS-502, for alfalfa weevil larvae under Montana conditions. **Stefan T. Jaronski** (stefan.jaronski@ars.usda.gov)[1], Govinda Shrestha[2] and Gadi V. P. Reddy[2], [1]USDA - ARS, Sidney, MT, [2]Montana State Univ., Conrad, MT

Poster: P-IE, Pollinators

Mile High Ballroom (Convention Center)

D3560 Bee counts and pollination deficits: Their role in Oregon blueberry production. **George D. Hoffman** (george.hoffman@oregonstate.edu) and Sujaya Rao, Oregon State Univ., Corvallis, OR

D3561 Varroa mites, *Varroa destructor*, detected in *Apis mellifera* hives in Guam, Saipan, and Tinian. Christopher Rosario and **Ross Miller** (millerr@triton.uog.edu), Univ. of Guam, Mangilao, Guam

D3562 Determining the effect of splitting honey bee (*Apis mellifera*) colonies on *Varroa destructor* population growth. **Cameron Jack** (cjack@ufl.edu) and James Ellis, Univ. of Florida, Gainesville, FL

D3563 Pollinator attractiveness of drought tolerant plants in the Texas High Plains. **Samuel Discua** (samuel.discua@ttu.edu) and Scott Longing, Texas Tech Univ., Lubbock, TX

D3564 Countering pollinator decline by increasing floral resources for insect visitors. **Joan Edwards** (jedwards@williams.edu)[1], David Smith[1], Julie Jung[2] and Lane Davis[1], [1]Williams College, Williamstown, MA, [2]Boston Univ., Boston, MA

D3565 Pathogen prevalence for bumble bees in an agricultural landscape. **Noel Hahn** (nghahn@gmail.com)[1] and Anne Averill[2], [1]Univ. of Massachusetts, East Wareham, MA, [2]Univ. of Massachusetts, Amherst, MA

D3566 Beneficial insects associated with blackberries bordered by native perennial and pasture border rows in Frankfort, Kentucky. **Karen Friley** (karen.friley@kysu.edu), John Sedlacek, Mamata Bashyal, Kyle Slusher and Sathya Govindasamy, Kentucky State Univ., Frankfort, KY

D3567 Differential attraction among crape myrtles (*Lagerstroemia* spp.: Myrtales: Lythraceae) for hymenopteran pollinators. **S. Kristine Braman** (kbraman@uga.edu)[1] and Jim Quick[2], [1]Univ. of Georgia, Athens, GA, [2]Univ. of Georgia, Griffin, GA

D3568 Establishing monarch butterfly habitat in Iowa. **Seth Appelgate** (sethapp@iastate.edu)[1], Richard Hellmich[2], Sue Blodgett[1], Steven Bradbury[1], Diane Debinski[3], Robert Hartzler[1] and John Pleasants[1], [1]Iowa State Univ., Ames, IA, [2]USDA - ARS, Ames, IA, [3]Montana State Univ., Bozeman, MT

D3569 Presentation withdrawn

D3570 Using biofertilizers to enhance mutualisms between specialty crops and beneficial insects. **Benjamin Glogoza** (benjamin.glogoza@ndsu.edu) and Deirdre Prischmann-Voldseth, North Dakota State Univ., Fargo, ND

D3615 A prairie hive companion: Can prairies help honey bee colonies thrive in intensively cultivated landscapes? **Harmen P. Hendriksma** (harmenhendriksma@gmail.com)[1], Ashley St. Clair[1], Ge Zhang[1], Adam Dolezal[1,2], Erin Hodgson[1], Matthew O'Neal[1] and Amy Toth[1], [1]Iowa State Univ., Ames, IA, [2]Univ. of Illinois, Champaign, IL

Poster: P-IE, Technology and Outreach

Mile High Ballroom (Convention Center)

D3571 Presentation withdrawn

D3572 Ignite, inspire, and innovate with "A Bug's Life": Enhancing education and life applications through entertainment. **Jerome F. Grant** (jgrant@utk.edu), Univ. of Tennessee, Knoxville, TN

D3573 Gender gap in academic and federal government entomology positions. **Karen Walker** (karen.a.walker@aphis.usda.gov), USDA - APHIS, Riverdale, MD

D3574 Fear and loathing in the classroom: How student attitudes about insects affect learning. **Kristen Brochu** (kb532@cornell.edu) and Kimberly Williams, Cornell Univ., Ithaca, NY

D3575 Introduction to Plant Health Risk Assessment. **Heather Cumming** (heather.cumming@inspection.gc.ca), Canadian Food Inspection Agency, Ottawa, ON, Canada

D3576 Longitudinal study of acceptability and preference motivations of Montana State University students and the local public in Gallatin Valley, Montana to edible insects. **Florence Dunkel** (fdunkel@montana.edu)[1], Holly Hunts[1], Arthur Bangert[1], James Rolin[1,2] and Michael Thienes[1], [1]Montana State Univ., Bozeman, MT, [2]Cowboy Cricket Farms, LLC, Belgrade, MT

D3577 Economic model for commercial cricket rearing for human food. **James Rolin** (james@cowboycrickets.com)[1,2], Florence Dunkel[2] and Michael Thienes[2], [1]Cowboy Cricket Farms, LLC, Belgrade, MT, [2]Montana State Univ., Bozeman, MT

D3578 Mass rearing *Acheta domesticus* in rural Mali. **Emma Kashian** (kashian.emma@gmail.com)[1], Florence Dunkel[1] and Hawa Coulibaly[2], [1]Montana State Univ., Bozeman, MT, [2]Women's Association of Sanambele, Sanambele, Mali

D3579 Comparison of acceptability and preference motivations of North Central Branch entomology graduate students, Montana trainers of sous chefs, and the Southern California Food Technologist to edible insects. **Holly Hunts** (hhunts@montana.edu)[1], Florence Dunkel[1], Arthur Bangert[1], James Rolin[1,2] and Michael Thienes[1], [1]Montana State Univ., Bozeman, MT, [2]Cowboy Cricket Farms, LLC, Belgrade, MT

Poster: SysEB, Ecology and Disease 2

Mile High Ballroom (Convention Center)

D3580 Patch area and connectivity do not predict arthropod species richness in a naturally fragmented kipuka landscape. **Elske Tielens** (elske.tielens@gmail.com), Maile Neel and Daniel Gruner, Univ. of Maryland, College Park, MD

D3581 Notes on the occurrence of *Oligonychus milleri* (McGregor) and *Oligonychus ununguis* (Jacobi) (Acari: Tetranychidae) in Brazil. **Elizeu B. Castro** (elizeu_unesp@yahoo.com.br)[1,2], Odair C. Zanardi[3], Juliana Garlet[3], Ronald Ochoa[4] and Reinaldo J. F. Feres[2], [1]Smithsonian Institution, Washington, DC, [2]Univ. Estadual Paulista, São José do Rio Preto, Brazil, [3]Univ. do Estado de Mato Grosso, Alta Floresta, Brazil, [4]USDA - ARS, Beltsville, MD

D3582 Context-dependent colonization: Regional reward contagion drives local compression in aquatic beetles. **Matthew Pintar** (matthew.pintar@gmail.com) and William Resetarits, Univ. of Mississippi, University, MS

D3583 The four-year acceleration of Brood X in Ohio in 2017 (Hemiptera: Cicadidae: *Magicicada* spp.). **Gene Kritsky** (cdarwin@aol.com) and Zachary Tegge, Mount St. Joseph Univ., Cincinnati, OH

D3584 Natural history observations of *Utabaenetes tanneri* (Orthoptera: Rhapidophoridae), a sand treader endemic to the Colorado Plateau. **Tim B. Graham** (lasius17@gmail.com), Retired, Moab, UT

D3585 First steps in the development of the sterile insect technique as a control tactic for the Asian citrus psyllid, *Diaphorina citri* Kuwayama (Hemiptera: Liviidae). **Francesc Gomez Marco** (francesc.g.marco@gmail.com)[1], Andrew Yoshimoto[1], Gregory S. Simmons[2] and Richard Stouthamer[1], [1]Univ. of California, Riverside, CA, [2]USDA - APHIS, Salinas, CA

D3586 The study of compression between different biorational pesticide against okra jassid (*Amrsca biguttula biguttula*) (Homoptera: Cicadellidae). **Muhammad Ali** (ali.klasra@gmail.com)[1], Muhammad Ashfaq[1] and Asim Gulzar[2], [1]Univ. of the Punjab, Lahore, Pakistan, [2]Pir Mehr Ali Shah Arid Agriculture Univ., Rawalpindi, Pakistan

D3587 An invasive ant and viral pathogens driving(?) honey bee hive collapse. **Evan Brenton-Rule** (evanbrentonrule@gmail.com), James Baty, Marion Saunders, Jessica Russell and Phil Lester, Victoria Univ., Wellington, New Zealand

D3588 Prevalence of honey bee (*Apis mellifera*) parasites across Texas. **Alexandra Herrera** (aherrera@shsu.edu), Autumn J. Smith-Herron, Nicole Traub, Kristina Young and Brian Chapman, Sam Houston State Univ., Huntsville, TX

D3589 New dolls in the nest: Recent bacterial endosymbionts in mealybugs and early intracellular mutualism. **Stephanie Weldon** (s.r.weldon@gmail.com) and John McCutcheon, Univ. of Montana, Missoula, MT

D3590 Hemipterans associated with wetland plant communities in a Missouri marsh (Heteroptera: Auchenorryncha). **Heather Shields** (has87750@ucmo.edu), Brandon Page, Joseph Ely and Stephen Wilson, Univ. of Central Missouri, Warrensburg, MO

D3591 Comparison of four techniques for sampling wetland Hemiptera in a Missouri marsh (Heteroptera: Auchenorrhyncha). **Brandon Page** (bpage@ucmo.edu), Heather Shields, Stephen Wilson and Joseph Ely, Univ. of Central Missouri, Warrensburg, MO

D3592 Effects of anthropogenic climatic and land use change on the elevational ranges of Colorado ants. **Tim Szewczyk** (tim.szewczyk@gmail.com) and Christy McCain, Univ. of Colorado, Boulder, CO

D3593 A mingling of dirt and light: Review of arthropods associated with root-wads, root-balls, tip-ups, etc. **Michael Ferro** (spongymesophyll@gmail.com), Clemson Univ., Clemson, SC

D3594 On the ecology of the ant mimic *Coquillettia insignis*: Life in an arthropod Serengeti. **James McIver** (james.mciver@oregonstate.edu), Oregon State Univ., Union, OR

D3595 Has climate change caused a shift in the photoperiodic response for diapause in a green lacewing? **James Nechols** (jnechols@ksu.edu)[1], John Ruberson[1], Dustyn King[1], Aavudai Anandhi[2] and Catherine A. Tauber[3], [1]Kansas State Univ., Manhattan, KS, [2]Florida A&M Univ., Tallahassee, FL, [3]Cornell Univ., Davis, CA

D3596 Phylogeography of eastern subterranean termites: Refugia and postglacial range expansion in the Appalachian Mountains. **Chaz Hyseni** (chyseni@go.olemiss.edu) and Ryan Garrick, Univ. of Mississippi, University, MS

D3597 Host and bacterial mechanisms of horizontal cell-to-cell transfer in *Wolbachia* endosymbionts of *Drosophila*. Shelbi Russell[1], **Nassim Lemseffer** (mlemseff@ucsc.edu)[1] and William Sullivan[2], [1]Univ. of California, Santa Cruz, CA, [2]Univ. of California, Santa Cruz, CA

Poster: SysEB, Identification and Outreach

Mile High Ballroom (Convention Center)

D3598 Bug Closet crawls with diversity. **Shiala Naranjo** (smorales20@knights.ucf.edu), Ryan Ridenbaugh, Joshua Hogan and Sandor Kelly, Univ. of Central Florida, Orlando, FL

D3599 Founding of the Broward College Insect Collection (BCIC): Goals, focus, timelines, and strategies to inspire undergraduate research at an urban minority serving institution. **David Serrano** (dserrano@broward.edu), Jennifer Bishop, Elizabeth Lavely and Branden Davis, Broward College, Davie, FL

D3600 The Insect Collectors' Code. **Andrew Deans** (adeans@psu.edu) and Carolyn Trietsch, Pennsylvania State Univ., University Park, PA

D3601 Using citizen science to illuminate firefly (Coleoptera: Lampyridae) localities in Utah. **Gavin Martin** (gmartin33@live.com)[1], Christy Bills[2], Rebecca Clement[1], Samantha Smith[1] and Seth M. Bybee[1], [1]Brigham Young Univ., Provo, UT, [2]Natural History Museum, Salt Lake City, UT

D3602 Seven life science POGIL activities developed through the broader impacts section of an NSF research project. **Laura Lavine** (lavine@wsu.edu)[1], Doug Emlen[2] and Mare Sullivan[3], [1]Washington State Univ., Pullman, WA, [2]Univ. of Montana, Missoula, MT, [3]Seattle Pacific Univ., Kirkland, WA

D3603 The beetle heritage of the Triplehorn Insect Collection: Cataloguing the primary types of Coleoptera. Natalia Molotievskiy, **Luciana Musetti** (musetti.2@osu.edu) and Norman Johnson, The Ohio State Univ., Columbus, OH

D3604 *An Introduction to the Aquatic Insects of North America*: A new edition. Richard Merritt[1], **M. Eric Benbow** (benbow@msu.edu)[1], Martin B. Berg[2] and Kenneth Cummins[1], [1]Michigan State Univ., East Lansing, MI, [2]Loyola Univ., Chicago, IL

D3605 Validating molecular methods for identifying *Helicoverpa armigera* and *H. zea*. **Alicia Timm** (aetimm@gmail.com)[1], Luke Tembrock[1], Frida Zink[1] and Todd Gilligan[2], [1]Colorado State Univ., Fort Collins, CO, [2]USDA - APHIS, Fort Collins, CO

D3606 Key to and descriptions of larval *Aphorista* Gorham (Coleoptera: Endomychidae). **Lisa Seelye** (bass.clarinet.21@gmail.com), Montana State Univ., Bozeman, MT

D3607 Generic revision of the dewdrop treehopper genera (Hemiptera: Membracidae). **Stuart McKamey** (stuart.mckamey@ars.usda.gov), USDA - ARS, Washington, DC

D3608 Identification of *Anastrepha striata* and *Anastrepha psidivora* larvae using DNA barcode as a molecular marker. **Pratibha Srivastava** (pratibha.srivastava@freshfromflorida.com), Cheryl Roberts, Erick Rodriguez, Ratna Karan, Ayyamperumal Jeyaprakash, Gary Steck, Jason Stanley and Leroy Whilby, Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

D3609 Lampyrids.com - Lampyridae primary types of world website. **Marc Branham** (marcbran@ufl.edu)[1], Oliver Keller[1] and Eugenio Nearns[2], [1]Univ. of Florida, Gainesville, FL, [2]Purdue Univ., West Lafayette, IN

D3610 Phylogenetic analysis of Ochrotrichiinae (Trichoptera: Hydroptilidae) based on molecular data. Isabela Rocha[1], **Allan Santos** (allanpms@gmail.com)[2] and Jorge Luiz Nessimian[1], [1]Univ. Federal do Rio de Janeiro, Rio de Janeiro, Brazil, [2]Univ. Federal do Estado do Rio de Janeiro, Rio de Janeiro, Brazil

D3611 (Wild) Bees of Montana, a new initiative. **Michael Ivie** (mivie@montana.edu), Casey Delphia, Kevin M. O'Neill and Laura A. Burkle, Montana State Univ., Bozeman, MT

Virtual Poster: MUVE

Mile High Ballroom (Convention Center)

VP54 Monitoring *Culicoides* species in forested habitat within the Piedmont region of Georgia: Seasonal variation and species composition. **Jaclyn McCollum** (jackpete@uga.edu), Joseph Corn, Mark Ruder, Stacey Vigil and Kayla Garret, Univ. of Georgia, Athens, GA

VP55 Alternative sweeteners for baits to control adult house flies, *Musca domestica* (Diptera: Muscidae). **Bethia H. King** (bking@niu.edu) and Edwin Burgess, IV, Northern Illinois Univ., DeKalb, IL

VP56 A study on the development of attractant feeding insecticide of *Blattela germanica* L. using bistrifluron. **Yong Jun Kwon** (yjkwon@farmhannong.com), Farmhannong Co., Ltd., Nonsan-si, South Korea

VP57 Ticks and prevalence of the lyme disease-causing spirochete *Borrelia burgdorferi* in deer ticks (*Ixodes scapularis*) in the Decorah, Iowa area. **Joshua Nelson** (jnelson@my.dom.edu) and Kirk Larsen, Luther College, Decorah, IA

VP58 Characterizing ticks and tick-borne diseases in the Sierra National Forest, California. **Cameron Osborne** (cjosborne@mail.fresnostate.edu), California State Univ., Fresno, CA

VP59 Is the increasing range of *Aedes albopictus* (Skuse) in Japan during the last half century due to global warming? **Osamu Komagata** (komagata@niid.go.jp), Yoshihide Maekawa, Naoko Nihei, Mutsuo Kobayashi and Kyoko Sawabe, National Institute of Infectious Diseases, Tokyo, Japan

Virtual Poster: P-IE

Mile High Ballroom (Convention Center)

VP60 Prolonged phloem feeding activities by *Diaphorina citri* nymphs may explain their greater acquisition of citrus greening pathogen compared to adults. **Justin George** (georgejustine@gmail.com)[1,2], El-Desouky Ammar[3], David Hall[1] and Stephen L. Lapointe[1], [1]USDA - ARS, Fort Pierce, FL, [2]Univ. of Florida, Lake Alfred, FL, [3]Univ. of Florida, Fort Pierce, FL

VP61 Predation of *Orius insidiosus* (Hemiptera: Anthocoridae) on *Chaetosiphon fragaefolii* and *Aphis gossypii* (Hemiptera: Aphididae) in strawberry. Estefanía Rizzo[1], Natalia Francesena[2], Mariángeles Alonso[2], Mariana Pascua[2], Margarita Rocca[2] and **Nancy Greco** (ngreco@cepave.edu.ar)[2], [1]Univ. Nacional de La Plata, CONICET, La Plata, Argentina, [2]Univ. Nacional de La Plata, CONICET, La Plata, Argentina

VP62 Characterization of local populations of *Pseudapanteles dignus* (Hymenoptera: Braconidae), a biological control agent of the South American tomato moth *Tuta absoluta* (Lepidoptera: Gelechiidae), in Argentina. **Consuelo Vallina** (consuelovallina@gmail.com)[1], Lilia Puch[2], Daniel Aquino[1], Maria G. Luna[1] and Norma Sanchez[1], [1]Univ. Nacional de La Plata, CONICET, La Plata, Argentina, [2]INTA, Yuto, Argentina

VP63 Awareness, support, and impact of HRI. **Jill Calabro** (jillc@americanhort.org)[1] and Jennifer Gray[2], [1]AmericanHort/HRI, Washington, DC, [2]AmericanHort/HRI, Columbus, OH

VP64 *Beauveria bassiana* reduces the incidence of bacterial wilt vectored by the striped cucumber beetle *Acalymma vittatum* in cantaloupe. **Gerald Brust** (jbrust@umd.edu), Univ. of Maryland, Upper Marlboro, MD

VP65 Ecosystem engineering and manipulation of host plant tissues by borer beetles. **Nancy Calderón-Cortés** (ncalderon@enesmorelia.unam.mx)[1], Mauricio Quesada[1], Claudia Uribe-Mú[2], Ana Martínez-Méndez[1] and Luis Escalera-Vázquez[3], [1]Univ. Nacional Autónoma de México, Morelia, Mexico, [2]Univ. de Guadalajara, Zapopan, Mexico, [3]Univ. Michoacana de. San Nicolás de Hidalgo, Morelia, Mexico

VP66 The lesser date moth *Batrachedra amydraula* (Lepidoptera: Batrachedridae): A pest of date fruits in the UAE. **Mohammad Ali Al-Deeb** (m_aldeeb@uaeu.ac.ae)[1] and Hamda Al-Dhaheri[2], [1]United Arab Emirates Univ., Al-Ain, United Arab Emirates, [2]Al-Ain Municipality, Al-Ain, United Arab Emirates

VP67 High-diversity pivot corners near agricultural fields increase abundance and diversity of beneficial insects. **Ruby Reynolds** (rubyander@outlook.com)[1], Kayla A. Mollet[2] and Julie Peterson[1], [1]Univ. of Nebraska, North Platte, NE, [2]Univ. of Nebraska, Lincoln, NE

VP68 Mississippi bug blues - Invasive awareness, conservation, and biodiversity. **Jason Sanders** (jsanders@entomology.msstate.edu), JoVonn Hill and Jennifer Seltzer, Mississippi State Univ., Mississippi State, MS

VP69 Root aphids in the greenhouse: Observations and recommendations. **Jeremy Jubenville** (jeremy.jubenville@gmail.com), West Michigan IPM, Kalamazoo, MI

VP70 Methyl salicylate attracts natural enemies and reduces cucumber plants palm thrips population. **Yaw Jen Dong** (yjdong@tari.gov.tw)[1] and Hwang Shaw-Yhi[2], [1]Taiwan Agricultural Research Institute, Wufeng, Taiwan, [2]National Chung Hsing Univ., Taichung, Taiwan

VP71 Long-term effects of different insecticides on the wireworm population (*Agriotes* spp.) in the soil. **Michael Zellner** (michael.zellner@lfl.bayern.de), Bavarian State Research Centre for Agriculture, Freising, Germany

NOTES:

HIGHLIGHTED POSTERS & VIRTUAL POSTERS

Highlighted Posters and Virtual Posters displayed throughout the week will be the same as those listed on Sunday, D3000-D3007 and VP01-VP02. See page 134 for titles and authors.

Wednesday, November 8, 2017 • MORNING

Sunrise Session: Igniting School Staff and Student Interest in IPM through Innovation

Meeting Room 703 (Convention Center)

Moderators and Organizers: Janet Hurley[1], Thomas Green[2], Susan T. Ratcliffe[3], Matthew Baur[4], Rebecca Baldwin[5] and Ruth Kerzee[6], [1]Texas A&M Univ., Dallas, TX, [2]IPM Institute of North America, Madison, WI, [3]North Central IPM Center, Urbana, IL, [4]Western IPM Center, Davis, CA, [5]Univ. of Florida, Gainesville, FL, [6]Midwest Pesticide Action Center, Chicago, IL

6:30 **1708** Igniting educator and student interest in IPM through STEM programs such as Bed Bugs and Bookbags and 4-H. **Rebecca Baldwin** (baldwinr@ufl.edu), Univ. of Florida, Gainesville, FL

6:45 **1709** Innovative ways to teach IPM to teachers, school staff, administrators, and others, without creating your own curriculum. **Janet Hurley** (ja-hurley@tamu.edu)[1], Dawn Gouge[2], Shaku Nair[2], Shujuan Li[2] and Thomas Green[3], [1]Texas A&M Univ., Dallas, TX, [2]Univ. of Arizona, Maricopa, AZ, [3]IPM Institute of North America, Madison, WI

7:00 **1710** Inspiring the public on pest control through story. **Ruth Kerzee** (rkerzee@pesticideaction.org), Midwest Pesticide Action Center, Chicago, IL

Sunrise Session: USDA-APHIS-BRS and EPA Training on Permitting for Genetically Engineered Insects

Meeting Room 705 (Convention Center)

Moderators and Organizers: Abigail Walter[1], Lisa Knolhoff[1] and Jeannette Martinez[2], [1]USDA - APHIS, Riverdale, MD, [2]U.S. Environmental Protection Agency, Washington, DC

6:30 **1711** Overview of USDA and US-EPA regulation of genetically engineered insects and the USDA - BRS permitting process. **Abigail Walter** (abigail.walter@aphis.usda.gov)[1], Lisa Knolhoff[1] and Jeannette Martinez[2], [1]USDA - APHIS, Riverdale, MD, [2]U.S. Environmental Protection Agency, Washington, DC

Program Symposium: Igniting Cross Disciplinarity, Inspiring Novel Research, and Innovating Solutions to the World's Biggest Killers: Ecological and Evolutionary Perspectives of Biodiversity in the Mosquitoes

Meeting Room 601 (Convention Center)

Moderators and Organizers: Michael Reiskind and Brian Wiegmann, North Carolina State Univ., Raleigh, NC

8:00 **1712** Introduction and phylogenomics to reconstruct the evolutionary history of mosquito diversification. **Brian Wiegmann** (bwiegman@ncsu.edu)[1], Michelle Trautwein[2] and David Yeates[3], [1]North Carolina State Univ., Raleigh, NC, [2]California Academy of Sciences, San Francisco, CA, [3]CSIRO, Acton, Australia

8:30 **1713** Barcodes, bionomics and biodiversity of *Anopheles* mosquitoes. **Yvonne-Marie Linton** (linton.yvonne3@gmail.com)[1] and Richard C. Wilkerson[2], [1]Walter Reed Biosystematics Unit, Suitland, MD, [2]Walter Reed Army Institute of Research, Washington, DC

8:45 **1714** Convergence in habitat specialization and morphology in *Aedes* mosquitoes. **John Soghigian** (jsoghigian@clarku.edu)[1], Theodore Andreadis[1] and Todd P. Livdahl[2], [1]Connecticut Agricultural Experiment Station, New Haven, CT, [2]Clark Univ., Worcester, MA

9:00 **1715** Evolutionary strategies and adaptations for survival among mosquito-parasitic microsporidia: Evidence for coevolution and host switching. **Theodore Andreadis** (theodore.andreadis@ct.gov), Connecticut Agricultural Experiment Station, New Haven, CT

9:15 **1716** Evolution of salt-water tolerant species in the *Anopheles gambiae* complex from a comparative genomic perspective. **Frederic Labbe** (f.labbe@rug.nl)[1], Michael Fontaine[1], Christina Bergey[2], R. Rebecca Love[2], Robert Waterhouse[3], Jonathan Kayondo[4], Krystal Birungi[4], Victor Balyesima[4], Harold Towson[5] and Nora J. Besansky[2], [1]Univ. of Groningen, Groningen, Netherlands, [2]Univ. of Notre Dame, Notre Dame, IN, [3]Univ. of Geneva, Geneva, Switzerland, [4]Uganda Virus Research Institute, Entebbe, Uganda, [5]Liverpool School of Tropical Medicine, Liverpool, United Kingdom

9:30 **1717** Patterns and consequences of global mosquito species diversity. **Desmond Foley** (foleydes@si.edu) and Richard Wilkerson, Walter Reed Army Institute of Research, Suitland, MD

9:45 **Break**

10:00 **1718** Mosquitoes and their microbes: Diversity across trophic levels and insights into disease transmission. **Shannon Bennett** (sbennett@calacademy.org), California Academy of Sciences, San Francisco, CA

10:15 **1719** Linking ecological profile, spatial distribution and microbiota diversity of anopheline larvae from remote villages on four river systems in Amazonian Peru. **Catharine Prussing** (cprussing@albany.edu)[1], Jan Conn[2], Marta Moreno[2], Sara A. Bickersmith[2], Marlon Saavedra[3], Carlos Tong Rios[4] and Joseph M. Vinetz[5], [1]State Univ. of New York, Albany, NY, [2]New York State Dept. of Health, Slingerlands, NY, [3]Univ. de Peruana Cayetano Heredia, Iquitos, Peru, [4]Univ. de Peruana Cayetano Heredia, Lima, Peru, [5]Univ. of California, La Jolla, CA

10:30 **1720** Assessing mosquito diversity and pathogen transmission: Lessons and insights from the *Culicoides*-ehd system. Andrew Park[1] and **Chris Stone** (cstone@illinois.edu)[2], [1]Univ. of Georgia, Athens, GA, [2]Univ. of Illinois, Champaign, IL

10:45 **1721** Landscape patterns of vector diversity: Processes and consequences for pathogens. **Michael Reiskind** (michael_reiskind@ncsu.edu), North Carolina State Univ., Raleigh, NC

Program Symposium: The Power of Cooperation: Collaborations that Facilitate Advancements in Science

Meeting Room 607 (Convention Center)

Moderators and Organizers: Carlos Esquivel[1], Adekunle Adesanya[2], Jocelyn R. Holt[3], Alix Whitener[4] and A. Glenn Skiles[5], [1]The Ohio State Univ., Wooster, OH, [2]Washington State Univ., Pullman, WA, [3]Texas A&M Univ., College Station, TX, [4]Washington State Univ., Wenatchee, WA, [5]Univ. of Kentucky, Lexington, KY

8:00 **Welcoming Remarks**

8:05 **1722** The x's and o's of academic collaborations. **Henry Fadamiro** (fadamhy@auburn.edu), Auburn Univ., Auburn, AL

8:20 **1723** Extending, improving, and applying your research through interdisciplinary and international collaboration. **Matthew Jones** (matthew.s.jones@wsu.edu)[1], Thomas Besser[1], Jason Tylianakis[2] and William E. Snyder[1], [1]Washington State Univ., Pullman, WA, [2]Univ. of Canterbury, Christchurch, New Zealand

8:35 **1724** Little insects, big city: A case study in large-scale collaborative research. **Katherine Todd** (todd.489@osu.edu)[1], Caitlin Burkman[1], Yvan Delgado de la Flor[1], Denisha Parker[2], Scott Prajzner[1], Christopher B. Riley[2], MaLisa Spring[1], Liu Yang[1] and Mary Gardiner[2], [1]The Ohio State Univ., Wooster, OH, [2]The Ohio State Univ., Columbus, OH

8:50 **1725** Translational Plant Sciences (TPS): A unique graduate program fostering collaboration. **Ashley Yates** (yates.229@buckeyemail.osu.edu), The Ohio State Univ., Wooster, OH

9:05 **1726** Bioinspiration: Bringing together entomologists, microbiologists, engineers, and more. **Catherine Dana** (cdana2@illinois.edu), Univ. of Illinois, Champaign, IL

9:20 **Break**

9:40 **1727** Strategies for managing collaboration between distant laboratory groups. **Robert Zinna** (zinnar@email.arizona.edu), Univ. of Arizona, Tucson, AZ

9:55 **1728** From the forests of French Guiana to the city of Singapore: Exploration, discovery and co-operation in taxonomic research. **Sarah Meierotto** (s.meierotto@uky.edu), Univ. of Kentucky, Lexington, KY

10:10 **1729** Ph.D. in 36 months via collaboration, prioritization, and dedication. **Hee Kim** (klaukkala@tamu.edu), Texas A&M Univ., College Station, TX

10:25 **1730** The ecology of dog heartworm disease. **Meredith Spence Beaulieu** (mrspenc2@ncsu.edu), Michael Reiskind and Robert Dunn, North Carolina State Univ., Raleigh, NC

10:40 **1731** From the individual scientist to the scientific community: Multi-trophic collaborations pave the way for success. **William Walker** (william.b.walker.iii@slu.se), Swedish Univ. of Agricultural Sciences, Alnarp, Sweden

10:55 **Roundtable Discussion Period**

11:40 **Concluding Remarks**

Workshop: Promulgate Your Passion: Techniques to Create, Engage, and Communicate Science

Meeting Room 703 (Convention Center)

Moderators and Organizers: Aaron Pomerantz[1], Phil Torres[2] and Chris A. Johns[3], [1]Univ. of California, Santa Monica, CA, [2]The Jungle Diaries, New York, NY, [3]Univ. of Florida, Gainesville, FL

8:00 AM - 12:00 PM

PBT Section Symposium: Chemical Ecology of Cerambycid Beetles: Basic Science and Practical Applications

Meeting Room 402 (Convention Center)

Moderators and Organizers: Jocelyn G. Millar[1] and Lawrence M. Hanks[2], [1]Univ. of California, Riverside, CA, [2]Univ. of Illinois, Champaign, IL

8:00 **Introductory Remarks**

8:15 **1732** Advances in cerambycid pheromone chemistry: From highly conserved to possibly unique structures. **Jocelyn G. Millar** (millar@ucr.edu)[1], Yunfan Zou[1], Weliton Silva[2], José Mauricio Bento[2] and Lawrence M. Hanks[3], [1]Univ. of California, Riverside, CA, [2]Univ. de São Paulo, Piracicaba, Brazil, [3]Univ. of Illinois, Champaign, IL

8:45 **1733** Pheromone chemistry and reproductive isolation in the subfamily Lamiinae (Coleoptera: Cerambycidae). **Linnea R. Meier** (linrmeier@gmail.com)[1], Yunfan Zou[2], Jocelyn G. Millar[2] and Lawrence M. Hanks[1], [1]Univ. of Illinois, Champaign, IL, [2]Univ. of California, Riverside, CA

9:00 **1734** Production of vespid alarm pheromones by cerambycids hints at a broader pattern of defensive chemical mimicry. **Robert Mitchell** (mitchellr@uwosh.edu)[1], Tomislav Curkovic[2], Judy A. Mongold-Diers[3], Jan Bergmann[4], Wittko Francke[5] and Lawrence M. Hanks[3], [1]Univ. of Wisconsin, Oshkosh, WI, [2]Univ. de Chile, Santiago, Chile, [3]Univ. of Illinois, Champaign, IL, [4]Pontificia Univ. Catolica, Valparaiso, Chile, [5]Univ. of Hamburg, Hamburg, Germany

9:15 **1735** Antennal transcriptomics of the brown spruce longhorn beetle, *Tetropium fuscum*. **Daniel Doucet** (daniel.doucet@canada.ca)[1], Jun Duan[1], Susan Bowman[1], Jeremy D. Allison[1], Robert Mitchell[2], Peter Krell[3] and Jon Sweeney[4], [1]Natural Resources Canada, Sault Ste. Marie, ON, Canada, [2]Univ. of Wisconsin, Oshkosh, WI, [3]Univ. of Guelph, Guelph, ON, Canada, [4]Natural Resources Canada, Fredericton, NB, Canada

9:30 **1736** Identification of pheromone biosynthetic genes in the longhorned beetle, *Neoclytus mucronatus mucronatus* (F.) (Coleoptera: Cerambycidae) using a differential gene expression approach. **Gabriel Hughes** (gabriel.hughes@ucr.edu)[1] and Matthew Ginzel[2], [1]Univ. of California, Riverside, CA, [2]Purdue Univ., West Lafayette, IN

9:45 **1737** Mating disruption for managing *Prionus californicus* (Coleoptera: Cerambycidae) in hops. **James D. Barbour** (jbarbour@uidaho.edu)[1], Diane G. Alston[2], Doug Walsh[3] and Michael Pace[4], [1]Univ. of Idaho, Parma, ID, [2]Utah State Univ., Logan, UT, [3]Washington State Univ., Prosser, WA, [4]Utah State Univ., Brigham City, UT

10:00 **Break**

10:15 **1738** Field evaluation of an attractant pheromone for the invasive velvet longhorned beetle, *Trichoferus campestris* (Cerambycinae: Hesperophanini). **Ann M. Ray** (raya6@xavier.edu)[1], Joseph Francese[2], Yunfan Zou[3], Kristopher Watson[4], Damon Crook[2] and Jocelyn G. Millar[3], [1]Xavier Univ., Cincinnati, OH, [2]USDA - APHIS, Buzzards Bay, MA, [3]Univ. of California, Riverside, CA, [4]Utah Dept. of Agriculture and Food, Salt Lake City, UT

10:30 **1739** First field evaluation of cerambycid pheromones in Africa. **Baldwyn Torto** (btorto@icipe.org)[1], Bridget Bobadoye[1], Ayuka Fombong[1], Bruno Leru[1], Karl Adlbauer[2], Lawrence M. Hanks[3] and Jocelyn G. Millar[4], [1]International Centre of Insect Physiology and Ecology, Nairobi, Kenya, [2]Karl-Franzens-Univ., Graz, Austria, [3]Univ. of Illinois, Champaign, IL, [4]Univ. of California, Riverside, CA

10:45 **1740** Evaluating control of *Anoplophora chinensis* in pecan orchards in China using attract and kill and acoustic technology. Stephen Sexton[1], Ai Hua Gao[1], **Jacob D. Wickham** (wickham@iccas.ac.cn)[2], Barukh Rohde[3], Richard Mankin[4], Shao Qiu Zheng[1] and Guang-Qin Liu[5], [1]Nanjing Xinan SinoGreen Biological Technology Co, Nanjing, China, [2]Chinese Academy of Sciences, Beijing, China, [3]Univ. of Florida, Gainesville, FL, [4]USDA - ARS, Gainesville, FL, [5]Jiangsu Academy of Agricultural Science, Nanjing, China

11:00 **1741** Identification of a cryptic female pheromone in Asian longhorned borer: Misleading natural enemies and chemical ecologists. **Tian Xu** (txu01@syr.edu)[1], Laura Hansen[1], Dong Cha[2], Dejun Hao[3], Longwa Zhang[4] and Stephen Teale[1], [1]State Univ. of New York, Syracuse, NY, [2]USDA - ARS, Hilo, HI, [3]College of Forestry, Nanjing, China, [4]Anhui Agricultural Univ., Hefei, China

11:15 **1742** What combinations of semiochemicals, trap placements and trap colors have the greatest efficacy for detecting cerambycids and other target taxa in exotic woodborer surveys? **Jon Sweeney** (jsweeney@nrcan.gc.ca)[1], Peter Silk[1], P. Mayo[1], Reginald Webster[1], Daniel Miller[2], Jerzy Gutowski[3], Krista Ryall[4], Qingfan Meng[5], Tomasz Mokrzycki[6], Li Yan[5], Joseph Francese[7], Leah Flaherty[8], Greg Pohl[9] and Davide Rassati[10], [1]Natural Resources Canada, Fredericton, NB, Canada, [2]USDA - Forest Service, Athens, GA, [3]Forest Research Institute, Bialowieza, Poland, [4]Natural Resources Canada, Sault Ste. Marie, ON, Canada, [5]Beihua Univ., Jilin City, China, [6]Warsaw Univ. of Life Sciences, Warsaw, Poland, [7]USDA - APHIS, Buzzards Bay, MA, [8]Univ. of Massachusetts, Amherst, MA, [9]Natural Resources Canada, Edmonton, AB, Canada, [10]Univ. of Padova, Padova, Italy

11:30 **1743** Live trapping cerambycid beetles to support host specificity testing for biological control. **Juli Gould** (juli.r.gould@aphis.usda.gov)[1], Breanne Aflague[2] and Luke McCartin[3], [1]USDA - APHIS, Buzzards Bay, MA, [2]Univ. of New Hampshire, Durham, NH, [3]Univ. of Vermont, Burlington, VT

11:45 **1744** Conservation of pheromone chemistry within the Cerambycidae, and implications for invasion biology. **Lawrence M. Hanks** (hanks@life.illinois.edu)[1] and Jocelyn G. Millar[2], [1]Univ. of Illinois, Champaign, IL, [2]Univ. of California, Riverside, CA

PBT Section Symposium: Efficacy and Durability of RNAi and RNAi Traits

Meeting Room 301 (Convention Center)

Moderators and Organizers: Elane Fishilevich[1], William Moar[2] and Ana Vélez[3], [1]Dow AgroSciences, Indianapolis, IN, [2]Monsanto Company, St. Louis, MO, [3]Univ. of Nebraska, Lincoln, NE

8:00 **1745** In-plant protection against the insect pest *Helicoverpa armigera* by trans-kingdom RNAi. **Peter Waterhouse** (peter.waterhouse@qut.edu.au)[1], Julia Baly[1], Rachel Doran[1], Karen Lee[1], Elane Fishilevich[2], Ignacio Larrinua[2] and Kenneth Narva[2], [1]Queensland Univ. of Technology, Brisbane, Australia, [2]Dow AgroSciences, Indianapolis, IN

8:30 **1746** RNA-based biocontrol for use in management of insect pests. **Sebastien Patiny** (sebastien.patiny@syngenta.com)[1], Matthew Bramlett[1], Geert Plaetinck[1], Pascale Feldmann[1], Kevin Donohue[2], Jason Vincent[3] and Yann Naudet[1], [1]Syngenta Ghent Innovation Center, Zwijnaarde, Belgium, [2]Syngenta Crop Protection, Research Triangle Park, NC, [3]Syngenta, Bracknell, United Kingdom

8:45 **1747** RNAi applications to control mosquitoes and tephritids using RNAi technologies. **Steve Whyard** (steve.whyard@umanitoba.ca), David Giesbrecht, David Boguski, Carlos Cruz, Roohollah Abbasi, Aditi Singh and Cassidy Erdelyan, Univ. of Manitoba, Winnipeg, MB, Canada

9:00 **1748** Using RNAi against *Varroa destructor* – A novel biopesticidal tool for effective control of the parasitic mite of honey bees. **Alex Inberg** (alex.inberg@monsanto.com)[1], Jim Masucci[2], Jennifer Taylor[2], Brandi Chiapelli[2], Dorit Avni[2] and Merav Gleit[2], [1]Monsanto Company, Chesterfield, MO, [2]Monsanto Company, St. Louis, MO

9:15 **1749** Sublethal effects of *vATPase-A* and *Snf7* dsRNAs on southern corn rootworm, *Diabrotica undecimpunctata howardi* Barber. **Adriano Pereira** (aelias374@yahoo.com.br)[1], Ana Vélez[2], Lance J. Meinke[2] and Blair Siegfried[3], [1]Univ. of Missouri, Columbia, MO, [2]Univ. of Nebraska, Lincoln, NE, [3]Univ. of Florida, Gainesville, FL

9:30 **1750** A midgut RNAi-based gene target for western corn rootworm control. **Amit Sethi** (amit.sethi@pioneer.com), Xu Hu, Jian-Zhou Zhao, Xiping Niu, Virginia Crane, Gary Sandahl, Albert Lu, John Mathis, Mark Nelson, Gusui Wu and Wendy Srnic, DuPont Pioneer, Johnston, IA

9:45 **1751** Characterization of *Sec23* as a novel RNAi trait for controlling western corn rootworm, *Diabrotica virgifera virgifera* Leconte (Coleoptera: Chrysomelidae). **Murugesan Rangasamy** (mrangasamy@dow.com)[1], Ana Vélez[2], David McCaskill[1], Adriano Pereira[3], Chitvan Khajuria[4], Premchand Gandra[1], Sarah Worden[1], Shannon Whitlock[1], Wendy Lo[1], Blair Siegfried[5] and Kenneth Narva[1], [1]Dow AgroSciences, Indianapolis, IN, [2]Univ. of Nebraska, Lincoln, NE, [3]Univ. of Missouri, Columbia, MO, [4]Monsanto Company, St. Louis, MO, [5]Univ. of Florida, Gainesville, FL

10:00 **Break**

10:15 **1752** Efficacy and resistance management of SmartStax and SmartStax Pro maize against CRW. **Matthew Caroll** (matthew.caroll@monsanto.com)[1], Graham P. Head[1], Sean Evans[1], Dwain Rule[2], Alan Willse[1], Thomas Clark[1], Nicholas Storer[2], Ronald Flannagan[3] and Luke Samuel[1], [1]Monsanto Company, St. Louis, MO, [2]Dow AgroSciences, Indianapolis, IN, [3]Monsanto Company, Chesterfield, MO

10:30 **1753** Next generation transgenic cotton: Pyramiding RNAi and Bt counters insect resistance. **Bruce Tabashnik** (brucet@ag.arizona.edu)[1], Mi Ni[2], Wei Ma[3], Xiaofang Wang[2], Meijing Gao[3], Yidong Wu[3], Tianzhen Zhang[3] and Zhen Zhu[2], [1]Univ. of Arizona, Tucson, AZ, [2]Chinese Academy of Sciences, Beijing, China, [3]Nanjing Agricultural Univ., Nanjing, China

10:45 **1754** How does *Diabrotica virgifera* sample the double-stranded RNA in its environment? **Kaycee Quarles** (kaycee.quarles@umassmed.edu)[1], Jenny Chen[2], Manuel Garber[1] and Phillip Zamore[1], [1]Univ. of Massachusetts Medical School, Worcester, MA, [2]Massachusetts Institute of Technology, Cambridge, MA

11:00 **1755** Knockdown of nuclease activity in the gut enhances RNAi efficiency in the Colorado potato beetle, *Leptinotarsa decemlineata*, but not in the desert locust, *Schistocerca gregaria*. **Annelies Philips** (annelies.philips@syngenta.com)[1], Jornt Spit[2], Jozef Vanden Broeck[2], Niels Wynant[2] and Geert Plaetinck[1], [1]Syngenta Ghent Innovation Center, Zwijnaarde, Belgium, [2]Katholieke Univ. Leuven, Leuven, Belgium

11:15 **1756** Fitness costs in western corn rootworm larvae associated with downregulation of RNAi pathway genes. **Carolina Camargo** (ccamargogil@ufl.edu)[1], Ke Wu[1], Elane Fishilevich[2], Kenneth Narva[2] and Blair Siegfried[1], [1]Univ. of Florida, Gainesville, FL, [2]Dow AgroSciences, Indianapolis, IN

11:30 **1757** RNAi resistance in the Western corn rootworm, *Diabrotica virgifera virgifera*. **Chitvan Khajuria** (chitvan.khajuria@monsanto.com)[1], Sergey Ivashuta[2], Elizabeth Wiggins[2], Lex Flagel[2], William Moar[1], Michael Pleau[2], Kaylee Miller[1], Yuanji Zhang[2], Parthasarathy Ramaseshadri[2], Brent Werner[1], Peter Jensen[1], Mao Chen[3], Anilkumar Gowda[2], Brian McNulty[2], Cara Vazquez[4], Renata Bolognesi[2], Jeff Haas[1], Graham P. Head[1] and Thomas Clark[2], [1]Monsanto Company, St. Louis, MO, [2]Monsanto Company, Chesterfield, MO, [3]Monsanto Company, Singapore, Singapore, [4]Monsanto Company, Waterman, IL

11:45 **1758** Selection of resistance to insecticidal RNAi in Colorado potato beetle (*Leptinotarsa decemlineata*). **Juan Luis Jurat-Fuentes** (jurat@utk.edu)[1], James Dee[1], William Moar[2], Philip Moore[1], James A. Baum[3], Jodie Beattie[2], Andrei Alyokhin[4], Mark Clough[5], Gary Felton[6], Russell Groves[7], Sandra R. Menasha[8], Ken Ostlie[9] and Silvia Rondon[10], [1]Univ. of Tennessee, Knoxville, TN, [2]Monsanto Company, St. Louis, MO, [3]Monsanto Company, Chesterfield, MO, [4]Univ. of Maine, Orono, ME, [5]North Carolina State Univ., Plymouth, NC, [6]Pennsylvania State Univ., University Park, PA, [7]Univ. of Wisconsin, Madison, WI, [8]Cornell Univ., Riverhead, NY, [9]Univ. of Minnesota, St. Paul, MN, [10]Oregon State Univ., Hermiston, OR

P-IE Section Symposium: Integrated Pest Management of Tropical Crops

Meeting Room 707 (Convention Center)

Moderators and Organizers: Rangaswamy Muniappan, Amer Fayad and Jaspreet Sidhu, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

8:00 **1759** The Integrated Pest Management Innovation Lab approach to pest management. John Bowman[1] and **Amer Fayad** (afayad@vt.edu)[2], [1]USAID Bureau for Food Security, Washington, DC, [2]Virginia Polytechnic Institute and State Univ.

8:15 **1760** Vegetable-based ecological engineering: Participatory development of a conservation biological control method for Asian rice landscape. **Buyung Hadi** (b.hadi@irri.org), International Rice Research Institute, Metro Manila, Philippines

8:30 **1761** Integrated pest management in Cambodia: Challenges and opportunities. **Kim Hian Seng** (skimhian@ideglobal.org)[1], Socheath Ong[2], Kimkhuy Khun[2] and Megan E. O'Rourke[3], [1]iDE Cambodia, Boeung Tumpun, Cambodia, [2]Royal Univ. of Agriculture, Phnom Penh, Cambodia, [3]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

8:45 **1762** Presentation withdrawn

9:00 **1763** Prospect for use of the egg parasitoid, *Trichogrammatoidae armigera* N. (Hymenoptera: Trichogrammatidae) against key pearl millet insect pests in the Sahel. **Malick Ba** (b.malick@cgiar.org)[1], L. Karimoune[1], Ibrahim Baoua[2] and Rangaswamy Muniappan[3], [1]International Crops Research Institute for the Semi-Arid Tropics, Niamey, Niger, [2]Univ. of Maradi, Maradi, Niger, [3]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

9:15 **Break**

9:30 **1764** The arrival of old enemy to a new continent: The fall armyworm crisis in Africa. **Tadele Tefera** (t.tefera@icipe.org)[1] and Rangaswamy Muniappan[2], [1]International Centre of Insect Physiology and Ecology, Nairobi, Kenya, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

9:45 **1765** Scaling up tomato IPM adoption through farmer participatory technology transfer in Kenya. **Jesca Mbaka** (jesca.mbaka@kalro.org)[1], Caesor Kambo[1], Samson Kihara[1], Beth Ndungu[1], Simon Wepukhulu[1], Hellen Muthengi[2], David Mokaya[2], Samuel Rugendo[2], Daniel Kamaru[2], John Cardina[3], Mark Erbaugh[4], Luis A. Cañas[3], M. Kleinhenz[4], Sally A. Miller[3], A. Maerere[5], George Norton[6], Peter Sseruwagi[7] and Robert L. Gilbertson[8], [1]KALRO, Thika, Kenya, [2]Agriculture Extension Dept., Tharaka-Nithi County, Kenya, [3]The Ohio State Univ., Wooster, OH, [4]The Ohio State Univ., Columbus, OH, [5]Sokoine Univ. of Agriculture, Morogoro, Tanzania, [6]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [7]Mikocheni Agriculture Research Institute, Dar es Salaam, Tanzania, [8]Univ. of California, Davis, CA

10:00 **1766** Tomato leafminer, *Tuta absoluta* and its management in Nepal. **Lalit Sah** (lpsah@ideglobal.org)[1], Mukti Devkota[1], Luke Colavito[1], Yubraj Dhakal[2], Shiva Yendyo[3], Yubak GC[4], Dilli Sharma[5], George Norton[6], Edwin Rajotte[7], Rangaswamy Muniappan[6] and Sulav Paudel[7], [1]iDE Nepal, Patan, Nepal, [2]CEAPRED, Kathmandu, Nepal, [3]Agricare Nepal Pvt. Ltd, Chitwan, Nepal, [4]Plant Protection Society of Nepal, Kathmandu, Nepal, [5]Plant Protection Directorate, Kathmandu, Nepal, [6]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [7]Pennsylvania State Univ., University Park, PA

10:15 **1767** Understanding the role of human-mediated pathways in pest spread: Case study of *Tuta absoluta*. Ahijin Adiga and **Jaspreet Sidhu** (jsidhu1@vt.edu), Virginia Polytechnic Institute and State Univ., Blacksburg, VA

10:30 **1768** Developing inclusive solutions to pest-management challenges: Analyzing the social relations between women and men to ensure equitable access to the benefits of agricultural research. **Daniel Sumner** (dmsumner@vt.edu), Virginia Polytechnic Institute and State Univ., Blacksburg, VA

10:45 **Discussion**

P-IE Section Symposium: Ecology in the Sixth Mass Extinction: Detecting and Understanding Rare Biotic Interactions

Meeting Room 711 (Convention Center)

Moderators and Organizers: Elsa Youngsteadt[1], Margarita López-Uribe[2] and Clyde E. Sorenson[1], [1]North Carolina State Univ., Raleigh, NC, [2]Pennsylvania State Univ., University Park, PA

8:00 **Introductory Remarks**

8:05 **1769** Insect defaunation in the Anthropocene: A global look at insect decline. **David Wagner** (david.wagner@uconn.edu), Univ. of Connecticut, Storrs, CT

8:20 **1770** Examining the management of rare insects through the lens of biotic interactions: A comparative case study of the American burying beetle and prairie mole cricket. **Daniel Howard** (daniel.howard@unh.edu) and Carrie Hall, Univ. of New Hampshire, Durham, NH

8:35 **1771** Using host-plant interactions to guide habitat restoration for the conservation of an endangered butterfly. **Elsita Kiekebusch** (emkiekeb@ncsu.edu) and Nick Haddad, North Carolina State Univ., Raleigh, NC

8:50 **1772** Microclimate and biotic interactions affect Karner blue butterfly occupancy and persistence in managed oak savanna habitats. **Ryan Walsh** (ryan.walsh@toledozoo.org), The Toledo Zoological Society, Toledo, OH

9:05 **1773** Pollination of *Pityopsis ruthii* (Asteraceae), a rare endangered perennial endemic to southeastern Tennessee. **John Skinner** (jskinner@utk.edu)[1], Philip Moore[2], William Klingeman[1] and Phillip Wadl[3], [1]Univ. of Tennessee, Knoxville, TN, [2]Eurofins Agroscience Services, Inc, Mebane, NC, [3]USDA - ARS, Charleston, SC

9:20 **1774** Pollination ecology of the world's most famous insectivorous plant, Venus flytrap. **Rebecca E. Irwin** (reirwin@ncsu.edu)[1], Matthew Bertone[1], Alison Fowler[1], Laura Hamon[1], Michael Kunz[2], Dale Suiter[3], Elsa Youngsteadt[1] and Clyde E. Sorenson[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina Botanical Garden, Chapel Hill, NC, [3]U.S. Fish and Wildlife Service, Raleigh, NC

9:35 **Break**

9:50 **1775** Conservation complexities: A case study of Taylor's checkerspot and its hosts. **Peter Dunwiddie** (pdunwidd@u.washington.edu) and Nathan Haan, Univ. of Washington, Seattle, WA

10:05 **1776** Africanized bee invasion associated with the local demise of a rare plant pollinator in southwest Utah. **Zachary Portman** (zportman@gmail.com)[1], Vincent J. Tepedino[1], Amber D. Tripodi[2], Allen Szalanski[3] and Susan Durham[1], [1]Utah State Univ., Logan, UT, [2]USDA - ARS, Logan, UT, [3]Univ. of Arkansas, Fayetteville, AR

10:20 **1777** Near-complete observations of flower visitors indicate flowers use local insects for pollination services. **Joan Edwards** (jedwards@williams.edu), Williams College, Williamstown, MA

10:35 **SP1778** Opportunistic attachment assembles plant-pollinator networks. **Lauren Ponisio** (lponisio@ucr.edu), Univ. of California, Riverside, CA

10:45 **1779** *Calceolaria* and its oil collecting bees: Understanding pollination over large spatial scales. **Anahí Espíndola** (anahi.espindola@gmail.com), Univ. of Idaho, Moscow, ID

11:00 **1780** Facultative mushroom-feeding in forest ants: *Aphaenogaster* and beyond. **Mary Jane Epps** (mycota@gmail.com)[1] and Clint Penick[2], [1]Mary Baldwin Univ., Staunton, VA, [2]North Carolina State Univ., Raleigh, NC

11:15 **1781** A tangled web within a *Drosophila*-nematode parasitism. **Vince Martinson** (v.martinson@rochester.edu)[1], Matthew Ballinger[2], Steve Perlman[2] and John Jaenike[1], [1]Univ. of Rochester, Rochester, NY, [2]Univ. of Victoria, Victoria, BC, Canada

11:30 **1782** Stealing the crown: Behavioral and chemical strategies used by cuckoo bumble bees to control their hosts. **Patrick Lhomme** (pxl63@psu.edu) and Heather M. Hines, Pennsylvania State Univ., University Park, PA

SD1783 Plant-pollinator interactions of a rare plant community on the California Channel Islands. **C. Sheena Sidhu** (cssidhu@ucr.edu) and Erin E. Wilson-Rankin, Univ. of California, Riverside, CA

SD1784 Pollination of Michaux's sumac, a federally endangered shrub in the southeastern US. **Elsa Youngsteadt** (ekyoungs@ncsu.edu)[1], Margarita López-Uribe[2] and Clyde E. Sorenson[1], [1]North Carolina State Univ., Raleigh, NC, [2]Pennsylvania State Univ., University Park, PA

11:45 **Poster session**

P-IE Section Symposium: Understanding the Host-Vector-Pathogen Interactions Involved in Citrus Greening Disease: Advances in Vector and Disease Control

Meeting Room 403 (Convention Center)

Moderators and Organizers: Justin George and Stephen L. Lapointe, USDA - ARS, Fort Pierce, FL

8:00 **Introductory Remarks**

8:05 **1785** Innovative control strategies for vectors of fruit tree phytoplasmas in Europe. **Jürgen Gross** (juergen.gross@julius-kuehn.de), Julius Kühn-Institut, Dossenheim, Germany

8:35 **1786** Multitrophic cascades caused by Candidatus *Liberibacte*r infection of citrus: Effects on vectors, their parasitoids, competing herbivores, and subterranean nematode communities. **Lukasz Stelinski** (stelinski@ufl.edu), Univ. of Florida, Lake Alfred, FL

8:50 **1787** In the era of citrus huanglongbing, can RNA interference contribute to vector control? **Nabil Killiny** (nabilkilliny@ufl.edu), Univ. of Florida, Lake Alfred, FL

9:05 **1788** Identification of peptides combination that successfully block *Canditatus* Liberibacter asiaticus transfer from Asian citrus psyllid nymphs to adults. **Dov Borovsky** (dovborovsky@gmail.com)[1], Eldesouky Ammar[2], Kasie Sturgeon[2], Erica Warwick[2], Marc Giulianotti[3], Radleigh Santos[3], Clemencia Pinilla[3] and Robert Shatters[1], [1]USDA - ARS, Fort Pierce, FL, [2]Univ. of Florida, Fort Pierce, FL, [3]Torrey Pines Institute for Molecular Studies, Port St. Lucie, FL

9:20 **1789** Targeting Asian citrus psyllid microbiota for management of Huanglongbing. **Andres Sandoval-Mojica** (smaf@ufl.edu)[1], Wayne Hunter[2] and Kirsten Pelz-Stelinski[1], [1]Univ. of Florida, Lake Alfred, FL, [2]USDA - ARS, Fort Pierce, FL

9:35 **1790** Sclerenchymatous fibrous ring acting as barriers to phloem feeding by ACP: Evidence from EPG and histological correlations. **Justin George** (georgejustine@gmail.com)[1], Eldesouky Ammar[2], David Hall[1] and Stephen L. Lapointe[1], [1]USDA - ARS, Fort Pierce, FL, [2]Univ. of Florida, Fort Pierce, FL

9:50 **Break**

10:05 **1791** Susceptibility of citrus and citrus-related germplasm to infestations of Asian citrus psyllid. **David Hall** (david.hall@ars.usda.gov), USDA - ARS, Fort Pierce, FL

10:20 **1792** Computational tools for understanding host-vector-pathogen interactions. **Denis Willett** (denis.willett@ars.usda.gov)[1], Justin George[2], Lukasz Stelinski[3] and Stephen L. Lapointe[2], [1]USDA - ARS, Gainesville, FL, [2]USDA - ARS, Fort Pierce, FL, [3]Univ. of Florida, Lake Alfred, FL

10:35 **1793** What is the impact of classical biocontrol on Asian citrus psyllid in California? **Mark S. Hoddle** (mark.hoddle@ucr.edu), Univ. of California, Riverside, CA

10:50 **1794** UV-based behavior in *Diaphorina citri*. **Sandra A. Allan** (sandy.allan@ars.usda.gov)[1], Thomson Paris[2] and Philip A. Stansly[3], [1]USDA - ARS, Gainesville, FL, [2]Univ. of Florida, Gainesville, FL, [3]Univ. of Florida, Immokalee, FL

11:05 **1795** Factors influencing Asian citrus psyllid response to volatiles from Candidatus *liberibacter asiaticus*-infected plants. **Xavier Martini** (xmartini@ufl.edu), Univ. of Florida, Lake Alfred, FL

11:20 **1796** Eat here and die! Phagostimulants for control of Asian citrus psyllid. **Stephen L. Lapointe** (stephen.lapointe@ars.usda.gov) and Justin George, USDA - ARS, Fort Pierce, FL

11:35 **Concluding Remarks**

SysEB Section Symposium: Integrative and Comparative Approaches to Understanding the Evolution of Social Behavior

Meeting Room 502 (Convention Center)

Moderators and Organizers: Sarah P. Lawson and Sandra Rehan, Univ. of New Hampshire, Durham, NH

8:00 **1797** Taking stock: The promise and limits of comparative social evolution. **Patrick Abbot** (patrick.abbot@vanderbilt.edu), Vanderbilt Univ., Nashville, TN

8:30 **1798** Physiological and behavioral adaptions for group-living in prolonged subsocial huntsman spiders (Sparassidae). **Linda Rayor** (lsr1@cornell.edu), Marissa Cardillo, Cole Gilbert and Elizabeth Murray, Cornell Univ., Ithaca, NY

8:45 **1799** Primitive sociality as a springboard to intraspecific and interspecific parasitism in *Tamalia* galling aphids (Hemiptera: Aphididae). **Donald G. Miller** (dgmiller@csuchico.edu), California State Univ., Chico, CA

9:00 **1800** Males matter: Parental pathogenic exposure reinforces the role of biparental care. **Erin Cole** (cole.eri@husky.neu.edu), Iulian Ilies and Rebeca B. Rosengaus, Northeastern Univ., Boston, MA

9:15 **1801** The trifecta: Three-year study of the Australian small carpenter bee *Ceratina australensis* across three populations in three different climate-zones. **Rebecca Dew** (rebecca.rmd@hotmail.com) and Sandra Rehan, Univ. of New Hampshire, Durham, NH

9:30 **1802** Neurobiology and social evolution in sweat bees. **Adam Smith** (adam_smith@gwu.edu), George Washington Univ., Washington, DC

9:45 **1803** Comparative transcriptomic analysis of a socially polymorphic bee provides insight into the origins of sociality. **Scott Groom** (scott.groom@adelaide.edu.au)[1], Sandra Rehan[2], Adam Cronin[3], Michael Schwarz[4] and Atsushi Kawakita[5], [1]Univ. of Adelaide, Glen Osmond, Australia, [2]Univ. of New Hampshire, Durham, NH, [3]Iwate Univ., Morioka, Japan, [4]Flinders Univ., Bedford Park, Australia, [5]Kyoto Univ., Otsu, Japan

10:00 **Break**

10:15 **1804** Social interactions and outcomes at the transition to cooperative sociality. **Jennifer H. Fewell** (j.fewell@asu.edu), Arizona State Univ., Tempe, AZ

10:30 **1805** Angry wasps vs. less angry wasps: Colony-level differences in aggression in *Vespula vulgaris* (Family: Vespidae) wasps. **Jennifer M. Jandt** (jjandt2@gmail.com), Univ. of Otago, Dunedin, New Zealand

10:45 **1806** Comparing the consequences of developmental food stress on task performance by adult bumblebee (*Bombus impatiens*) and honey bee (*Apis mellifera*) workers. **Heather Mattila** (hmattila@wellesley.edu)[1], Anne Shen[1] and Hailey Scofield[2], [1]Wellesley College, Wellesley, MA, [2]Cornell Univ., Ithaca, NY

11:00 **1807** Predictive behavioral demography: Do individual honey bee workers follow distinct trajectories in life? **Olav Rueppell** (olav_rueppell@uncg.edu), Univ. of North Carolina, Greensboro, NC

11:15 **1808** Regulation of worker reproduction by brood signals in the clonal raider ant. **Qian Sun** (qsun@rockefeller.edu) and Daniel Kronauer, Rockefeller Univ., New York, NY

11:30 **1809** Signatures of selection on social cognition in paper wasp genomes. **Michael Sheehan** (msheehan@cornell.edu), Cornell Univ., Ithaca, NY

11:45 **1810** Rapid evolution of a gentle Africanized honey bee population via soft selective sweep. **Arián Avalos** (aavalos@illinois.edu)[1], Hailin Pan[2], Cai Li[2], Jenny Acevedo-Gonzales[1], Gloria Rendon[1], Christopher Fields[3], Patrick Brown[1], Tugrul Giray[4], Gene E. Robinson[1], Matthew E. Hudson[1] and Guojie Zhang[2], [1]Univ. of Illinois, Champaign, IL, [2]Beijing Genomics Institute, Shenzhen, China, [3]Roy J. Carver Biotechnology Center, Urbana, IL, [4]Univ. of Puerto Rico, San Juan, PR

Member Symposium: Applying Emerging Genomic Techniques to Control Invasive Species

Meeting Room 704 (Convention Center)

Moderators and Organizers: Scott Geib, Sheina Sim and Julian Dupuis, USDA - ARS, Hilo, HI

8:00 **1811** Invasion biology meets the 21st century: Harnessing the power citizen science in the genomics era. **Sean Ryan** (ecophylic@gmail.com)[1,2], Gerard Talavera[3], Vlad Dinca[4], Roger Vila[4], Anne Espeset[5], Mark Renshaw[6], Meredith Doellman[7], Emily Hornett[8], Michael Pfrender[7] and DeWayne Shoemaker[2], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of Tennessee, Knoxville, TN, [3]Harvard Univ., Cambridge, MA, [4]Institut de Biologia Evolutiva, Barcelona, Spain, [5]Univ. of Nevada, Reno, NV, [6]Hawai'i Pacific Univ., Waimanalo, HI, [7]Univ. of Notre Dame, Notre Dame, IN, [8]Univ. of Cambridge, Cambridge, United Kingdom

8:15 **1812** Biosurveillance of Alien Forest Enemies (bioSAFE) - Creating new genomic tools to meet the challenges posed by forest alien invasives. **Richard Hamelin** (richard.hamelin@ubc.ca)[1,2], Amanda Roe[3], Michel Cusson[4], Sandrine Picq[4], Brent Sinclair[5] and Ilga Porth[2], [1]Univ. of British Columbia, Vancouver, BC, Canada, [2]Univ. Laval, Québec City, QC, Canada, [3]Natural Resources Canada, Sault Ste. Marie, ON, Canada, [4]Natural Resources Canada, Québec City, QC, Canada, [5]Univ. of Western Ontario, London, ON, Canada

8:30 **1813** Forest health genomics of the conifers defense syndrome against insects. **Justin Whitehill** (whiteh5@msl.ubc.ca)[1], Macaire Yuen[1], Hannah Henderson[1], Matthias Schuetz[1], Jennifer Bryan[1], Barry Jacquish[2], Ward Strong[2], A. Lacey Samuels[1], Shawn Mansfield[1] and Joerg Bohlmann[1], [1]Univ. of British Columbia, Vancouver, BC, Canada, [2]Ministry of Forests, Lands and Natural Resource Operations, Vernon, BC, Canada

8:45 **1814** New insights into the evolution and genomic basis of specialized phytophagy in beetles. **Duane D. McKenna** (dmckenna@memphis.edu)[1], Seunggwan Shin[2] and Dave Clarke[1], [1]Univ. of Memphis, Memphis, TN, [2]North Carolina State Univ., Raleigh, NC

9:00 **1815** Diagnostic phylogenomics for food security. **Julian Dupuis** (jrdupuis@hawaii.edu)[1,2], Forest Bremer[2], Michael San Jose[2], Daniel Rubinoff[2] and Scott Geib[1], [1]USDA - ARS, Hilo, HI, [2]Univ. of Hawai'i, Honolulu, HI

9:15 **1816** Global population genomics of *Bactrocera dorsalis* s.lat.: Species boundaries and introgression in these global invaders. **Michael San Jose** (mdsjose@hawaii.edu)[1], Luc Leblanc[2], Sheina Sim[3], Scott Geib[3] and Daniel Rubinoff[1], [1]Univ. of Hawai'i, Honolulu, HI, [2]Univ. of Idaho, Moscow, ID, [3]USDA - ARS, Hilo, HI

9:30 **1817** Insights into the swede midge (*Contarinia nasturtii*) salivary gland transcriptome and implications for pest management. **Boyd Mori** (boyd.mori@canada.ca), Cathy Coutu, Edyta Sieminska, Dwayne Hegedus and Martin Erlandson, Agriculture and Agri-Food Canada, Saskatoon, SK, Canada

9:45 **Break**

10:00 **1818** Using novel, low cost sequencing technologies to improve genomic resources for stored product pests. **Erin Scully** (erin.scully@ars.usda.gov)[1], Scott Geib[2] and Sheina Sim[2], [1]USDA - ARS, Manhattan, KS, [2]USDA - ARS, Hilo, HI

10:15 **1819** Model chasing: Using RNAi to get a handle on a non-model hemipteran pest. **Joe Hull** (joe.hull@ars.usda.gov), Evelien Van Ekert, Jeffrey A. Fabrick and Colin Brent, USDA - ARS, Maricopa, AZ

10:30 **1820** Utilizing system biology resources to decipher a tritropic disease complex. **Prashant Hosmani** (psh65@cornell.edu)[1], Mirella Flores-Gonzalez[2], Noé Fernández-Pozo[2], Susan Brown[3], Lukas Mueller[2] and Surya Saha[2], [1]Sol Genomics Network, Ithaca, NY, [2]Boyce Thompson Institute for Plant Research, Ithaca, NY, [3]Kansas State Univ., Manhattan, KS

10:45 **1821** Use of genome and transcriptome information for the development of male-only strains of the New World screwworm. **Max Scott** (mjscott3@ncsu.edu)[1], Ying Yan[1] and Carolina Concha[2], [1]North Carolina State Univ., Raleigh, NC, [2]Smithsonian Tropical Research Institute, Panama City, Panama

11:00 **1822** Genetic elimination of an invasive mosquito: Strategies and concerns. **Zach Adelman** (zachadel@tamu.edu), Texas A&M Univ., College Station, TX

11:15 **1823** RMCE for unbiased comparison of transgenic systems in *Aedes aegypti*. Irina Haecker[1] and **Marc Schetelig** (marc.schetelig@agrar.uni-giessen.de)[2], [1]Justus-Liebig-Univ., Gießen, Germany, [2]Fraunhofer Institute for Molecular Biology and Applied Ecology, Gießen, Germany

Member Symposium: Aquatic Entomology: Innovative Strategies in Research, Education, and Outreach

Meeting Room 708 (Convention Center)

Moderators and Organizers: Courtney Larson[1] and Andrea Kautz[2], [1]Michigan State Univ., East Lansing, MI, [2]Carnegie Museum of Natural History, Rector, PA

8:00 **Welcoming Remarks**

8:05 **1824** Prairie stream ecology: Temporal and spatial patterns of invertebrate community structure. **Jessica Warwick** (jmwx86@mail.missouri.edu) and Robert W. Sites, Univ. of Missouri, Columbia, MO

8:20 **1825** Bridging ecology and systematics: 30 years of study of larval morphology of world Hydradephaga (Coleoptera). **Yves Alarie** (yalarie@laurentian.ca), Laurentian Univ., Sudbury, ON, Canada

8:35 **SP1826** Oviposition preference and larval development of *Aedes albopictus* in downspout extensions. **Joseph Nelsen** (joseph.nelsen@usm.edu), Donald Yee, James Deerman and Taylor Price, Univ. of Southern Mississippi, Hattiesburg, MS

8:45 **1827** Biodiversity of the aquatic Coleoptera of Mexico. **Magali Luna-Luna** (magui_ll89@hotmail.com), Andrea Abela-Posada and Atilano Contreras-Ramos, Univ. Nacional Autónoma de México, Mexico City, Mexico

9:00 **1828** An introduction to Macroinvertebrates.org, a digital teaching collection created using gigapixel image technology. **Andrea Kautz** (kautza@carnegiemnh.org)[1], John Wenzel[1], John C. Morse[2], Madeline Genco[2] and Marti Louw[3], [1]Carnegie Museum of Natural History, Rector, PA, [2]Clemson Univ., Clemson, SC, [3]Carnegie Mellon Univ., Pittsburgh, PA

9:15 **1829** Contemporary studies in freshwater entomology. **John C. Morse** (jmorse@clemson.edu), Clemson Univ., Clemson, SC

9:45 **Break**

10:00 **1830** Linking thermal physiology and life history outcomes in the mayfly *Neocloeon triangulifer*. **David Buchwalter** (david_buchwalter@ncsu.edu) and Hsuan Chou, North Carolina State Univ., Raleigh, NC

10:15 **1831** Shedding light on emerald ash borer (*Agrilus planipennis*) indirect effects on aquatic ecosystem function. **Courtney Larson** (larso126@msu.edu), Patrick Engelken, Jennifer Pechal, Deborah G. McCullough and M. Eric Benbow, Michigan State Univ., East Lansing, MI

10:30 **1832** The ecological importance of resource subsidies on insect-microbe interactions in aquatic ecosystems: The dispersal of novel microbes and their genomes in insect communities. **M. Eric Benbow** (benbow@msu.edu)[1], Jennifer Pechal[1], Courtney Larson[1], Patrick Engelken[1], Deborah G. McCullough[1], Ryan McEwan[2] and Kevin Custer[2], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Dayton, Dayton, OH

10:45 **1833** Stream bugs are useful: A data-driven lab activity targeting negative perceptions about invertebrates. **James Kopco** (jk729@cornell.edu)[1], Alyssa McDonough[2] and Deirdre Prischmann-Voldseth[1], [1]North Dakota State Univ., Fargo, ND, [2]Minnesota State Univ., Moorhead, MN

11:00 **1834** Long-term aquatic invertebrate monitoring at National Park Service properties in the Midwest region. **David E. Bowles** (david_bowles@nps.gov), U.S. National Park Service, Republic, MO

11:15 **1835** A missing trophic link? Algal contribution to insect diversity in headwater streams. **Rebecca Eckert** (eckertra@gmail.com) and William O. Lamp, Univ. of Maryland, College Park, MD

11:30 **SP1836** Enticement through immersion: Recruitment and training of the next generation of aquatic entomologists. **Jeffrey Heilveil** (jeffrey.heilveil@oneonta.edu), State Univ. of New York, Oneonta, NY

Member Symposium: Insects: It's What's for Dinner!

Meeting Room 706 (Convention Center)

Moderator and Organizer: Marianne Shockley, Univ. of Georgia, Athens, GA

8:00 **Welcoming Remarks**

8:05 **1837** Human and chimpanzee termite preferences. **Julie Lesnik** (julie.lesnik@wayne.edu), Wayne State Univ., Detroit, MI

8:20 **1838** Tinkering with black soldier fly biology to produce a more efficient industry. **Jeffery Tomberlin** (jktomberlin@tamu.edu), Chelsea Holcomb, Brittny Jones and Jonathan A. Cammack, Texas A&M Univ., College Station, TX

8:35 **1839** Rocky Mountain Micro Ranch. **Wendy McGill** (wendylumcgill@gmail.com), Rocky Mountain Micro Ranch, Denver, CO

8:50 **1840** The digestibility of black soldier flies in ruminants. Shakara Maggitt and **Marianne Shockley** (entomolo@uga.edu), Univ. of Georgia, Athens, GA

9:05 **1841** Edible insects: Seen or unseen? **David Gordon** (thebugchef@davidgeorgegordon.com), The Bug Chef, Seattle, WA

9:20 **1842** Consumer perspective towards an insect-derived equine feed. **Jaclyn McCollum** (jackpete@uga.edu), Univ. of Georgia, Athens, GA

9:35 **Break**

9:50 **1843** Effects of irradiance (W/m^2) on mating of the black soldier fly [*Hermetia illucens* (Diptera: Stratiomyidae)]. **John Schneider** (jcs1@msstate.edu), Mississippi State Univ., Mississippi State, MS

10:05 **1844** What do Salma Hayek, Questlove, Mark Cuban, Indra Nooyi, Amelia Boone and Kofi Annant have in common? They're all on board with bug-eating! **Robert Allen** (rna0014@gmail.com), Little Herds, Austin, TX

10:20 **1845** Age-dependent food utilization in small groups of *Acheta domesticus* (Orthoptera: Gryllidae) at two temperatures. **Juan Morales-Ramos** (juan.moralesramos@ars.usda.gov)[1], M. Guadalupe Rojas[1] and Aaron Dossey[2], [1]USDA - ARS, Stoneville, MS, [2]All Things Bugs LLC, Gainesville, GA

10:35 **1846** Entomo Farms: Past, present, and future. **Jarrod Goldin** (jarrod@entomofarms.com), Entomo Farms, Norwood, ON, Canada

10:50 **1847** Opportunities and challenges of automated insect farming at scale. **Roger Duncan Selby** (duncan.selby@aspirefg.com), Aspire Food, Austin, TX

11:05 **1848** Crickets and mealworms as a value added ingredient in rice, pasta, and ramen. **Julianne Kopf** (julianne@bugeaterfoods.com), Bugeater Foods, Lincoln, NE

11:20 **SP1849** Effects of feeding on different waste products and exposure to moxidectin on development of black soldier fly larvae. **Andrei Alyokhin** (alyokhin@maine.edu), Univ. of Maine, Orono, ME

11:30 **2223** Probiotics enhance black soldier fly growth and nutrition. **Heather Jordan** (jordan@biology.msstate.edu), Mississippi State Univ., Mississippi State, MS

11:45 **Concluding Remarks**

Member Symposium: Pollinator Nutrition: Lessons from Bees at Individual to Landscape Levels

Meeting Room 501 (Convention Center)

Moderators and Organizers: Vanessa Corby-Harris[1], Margaret Couvillon[2] and Roger Schurch[2], [1]USDA - ARS, Tucson, AZ, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

8:00 **Introductory Remarks**

8:10 **1850** Contrasting regulation of dietary fatty acid intake and tissue fatty acid profiles of fall and spring honey bees (*Apis mellifera*) reflect differences in their seasonal life history traits. **Steven Cook** (steven.cook@ars.usda.gov)[1] and Mark J. Carroll[2], [1]USDA - ARS, Beltsville, MD, [2]USDA - ARS, Tucson, AZ

8:25 **1851** Bee health and foraging behavior are unified through pollen nutritional quality. **Anthony Vaudo** (advaudo@gmail.com), Pennsylvania State Univ., University Park, PA

8:40 **1852** Do worker honey bees differ in physiological and immunological responses to *Nosema* based on seasonal pollens and annual colony cycles? **Gloria DeGrandi-Hoffman** (gloria.hoffman@ars.usda.gov), Stephanie Gage and Vanessa Corby-Harris, USDA - ARS, Tucson, AZ

8:55 **1853** Transcriptional and nutritional signatures of diet quality in the fat body of bumble bee (*Bombus impatiens*) queens. **Michelle Duennes** (maduennes@gmail.com)[1], Joshua Der[2], Shalene Jha[3] and S. Hollis Woodard[1], [1]Univ. of California, Riverside, CA, [2]California State Univ., Fullerton, CA, [3]Univ. of Texas, Austin, TX

9:10 **1854** Gut microbiota composition is associated with environmental landscape and behavioural task in honey bees. **Julia Jones** (julia.jones@imbim.uu.se)[1], Carmelo Fruciano[2], Joshua Marchant[3], Hasan Al Toufailia[3], Nicholas Balfour[3], Falk Hildebrand[4], Peer Bork[5], Philipp Engel[6], Francis Ratnieks[3] and William Hughes[3], [1]Uppsala Univ., Uppsala, Sweden, [2]Queensland Univ. of Technology, Brisbane, Australia, [3]Univ. of Sussex, Brighton, United Kingdom, [4]European Molecular Biology Laboratory, Heidelberg, Germany, [5]Univ. of Würzburg, Würzburg, Germany, [6]Univ. de Lausanne, Lausanne, Switzerland

SD1855 From bloom to boom: Investigating Oregano de la Sierra (*Monarda fistulosa*) for potential bee and human health. **Robert Heyduck** (rheyduck@nmsu.edu)[1], Melanie Kirby[2] and Todd Bates[3], [1]New Mexico State Univ., Alcalde, NM, [2]Zia Queenbees Farm and Field Institute, Taos, NM, [3]New Mexico Native Plant Recyclers, Embudo, NM

SD1856 Longitudinal evaluation of honey bee colonies in almond orchards with access to different forage regimes. **Elina Niño** (elnino@ucdavis.edu) and Bernardo Niño, Univ. of California, Davis, CA

SD1857 Diet quantity influence phenotypic dimorphism during honey bee (*Apis mellifera*) caste determination. Garett Slater[1], George Yocum[2] and **Julia Bowsher** (julia.bowsher@ndsu.edu)[1], [1]North Dakota State Univ., Fargo, ND, [2]USDA - ARS, Fargo, ND

SD1858 Assessing effects of land cover on nectar flows in the Raleigh area. **Annie Krueger** (annie.krueger.ext@bayer.com) and Allen Olmstead, Bayer CropScience, Research Triangle Park, NC

SD1859 Effects of diets containing varying levels of pollen and protein supplement on honeybee (*Apis mellifera*) nutritional condition and virus titers. **Emily de Jong** (ewatkinsdejong@email.arizona.edu)[1] and Gloria DeGrandi-Hoffman[2], [1]Univ. of Arizona, Tucson, AZ, [2]USDA - ARS, Tucson, AZ

SD1860 Location, location, location: Developing tools for selection of landscapes to promote healthy bee populations. **Tyler Jones** (toj2@psu.edu)[1], Margaret Douglas[1], Eric Lonsdorf[2], Douglas Miller[1], Maryann Frazier[1], Harland Patch[1] and Christina M. Grozinger[1], [1]Pennsylvania State Univ., University Park, PA, [2]Franklin and Marshall College, Lancaster, PA

SD1861 Honey bee queen pheromone communication and queen-worker interactions in a time of dearth. **Mark Carroll** (mark.carroll@ars.usda.gov), Nicholas Brown, Zachary Ruetz and Erica Chang, USDA - ARS, Tucson, AZ

SD1862 Direct and indirect nutritive effects of pollen consumption on honeybee physiology. **Vincent Ricigliano** (vincent.ricigliano@ars.usda.gov), USDA - ARS, Tucson, AZ

SD1863 *Nosema* parasitism in the honey bee brain: A neuroethology approach toward a honey bee stressor implicated in colony losses. **Stephanie Gage** (stephanie.gage@ars.usda.gov)[1], Katherine Kramer[2], Samantha Calle[1], Austin Rodrigues[1], Natalia Jacobson[1], Mark J. Carroll[1], Michael Heien[2] and Gloria DeGrandi-Hoffman[2], [1]USDA - ARS, Tucson, AZ, [2]Univ. of Arizona, Tucson, AZ

SD1864 Diet related gut bacterial dysbiosis correlates with impaired development, increased mortality and *Nosema* disease in the honey bee (*Apis mellifera*). **Patrick Maes** (pmaes@email.arizona.edu)[1], Pedro Augusto Rodrigues[2], Randy Oliver[3], Brendon Mott[4] and Kirk E. Anderson[1], [1]USDA – ARS, , Tucson, AZ, [2]Univ. of Arizona, Tucson, AZ, [3]ScientificBeekeeping.com, Grass Valley, CA

SD1865 Can providing diverse fall habitat for honey bees rescue colonies from pre-overwintering health declines in Iowa? **Ashley St. Clair** (astclair@iastate.edu)[1], Adam Dolezal[1,2], Ge Zhang[1], Edward Hsieh[1], Matthew O'Neal[1] and Amy Toth[1], [1]Iowa State Univ., Ames, IA, [2]Univ. of Illinois, Champaign, IL

SD1866 Palynological analysis of pollen collected by honey bees (*Apis mellifera*) in developed areas in four regions of the United States. **Pierre Lau** (plau0168@tamu.edu)[1], Juliana Rangel[1], Vaughn Bryant[1], Ana Cabrera[2], Daniel Schmehl[2], Joseph Sullivan[3], Zachary Y. Huang[4] and James Ellis[5], [1]Texas A&M Univ., College Station, TX, [2]Bayer CropScience, Research Triangle Park, NC, [3]Ardea Consulting, Woodland, CA, [4]Michigan State Univ., East Lansing, MI, [5]Univ. of Florida, Gainesville, FL

SD1867 Sex differences in the utilization of essential and non-essential amino acids in Lepidoptera. **Goggy Davidowitz** (goggy@email.arizona.edu)[1], Marshall McCue[2] and Eran Levin[1], [1]Univ. of Arizona, Tucson, AZ, [2]Saint Mary's Univ., San Antonio, TX

SD1868 Nutrition based foraging preferences of pollinator species on ornamental plants. **Emily Erickson** (ere6@psu.edu), Pennsylvania State Univ., University Park, PA

SD1869 Effect of landscape complexity on diversity of pollen collected by *Apis mellifera*. **Ashley Fersch** (aaf72@cornell.edu), Lauren Truitt, Nelson Milano and Scott McArt, Cornell Univ., Ithaca, NY

9:25 **Break and Poster Session**

10:10 **SP1870** Landscape and dietary breadth differentially influence health in honey bees and *Melissodes desponsa*. **Christina Mogren** (cmogren@gmail.com)[1], Maria Benitez[2], Kevin McCarter[1], Frédéric Boyer[3] and Jonathan Lundgren[4], [1]Louisiana State Univ., Baton Rouge, LA, [2]USDA - ARS, Brookings, SD, [3]Laboratoire d'Écologie Alpine, Grenoble, France, [4]Ecdysis Foundation, Estelline, SD

10:20 **1871** The "where" and "when" of honey bee decline in an agricultural landscape. **Adam Dolezal** (adolezal@iastate.edu)[1,2], Ashley St. Clair[1], Ge Zhang[1], Matthew O'Neal[1] and Amy Toth[1], [1]Iowa State Univ., Ames, IA, [2]Univ. of Illinois, Champaign, IL

10:35 **1872** Bees and the urban food scene. **Douglas Sponsler** (sponslerdb@gmail.com)[1], Don Shump[2], Harland Patch[1] and Christina M. Grozinger[1], [1]Pennsylvania State Univ., University Park, PA, [2]Philadelphia Bee Company, Philadelphia, PA

10:50 **1873** Fitness responses of wild bees (*Osmia cornifrons*) to their environment: The interactive effects of landscape complexity, pesticide exposure, and pollen diet diversity. **Mary Centrella** (mlc344@cornell.edu)[1], Brian D. Eitzer[2], Heather Grab[1], Katja Poveda[1] and Bryan N. Danforth[1], [1]Cornell Univ., Ithaca, NY, [2]Connecticut Agricultural Experiment Station, New Haven, CT

11:05 **1874** Can restored prairies contribute significantly to the diets of *Apis mellifera* (honey bee) colonies in the upper Midwest? **Morgan Carr-Markell** (carrm163@umn.edu)[1], Cora Demler[1], Margaret Couvillon[2], Roger Schurch[2], R. Scott Cornman[3], Deborah Iwanowicz[4] and Marla Spivak[1], [1]Univ. of Minnesota, St. Paul, MN, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [3]U.S. Geological Survey, Fort Collins, CO, [4]U.S. Geological Survey, Kearneysville, WV

11:20 **1875** From landscapes to flowers: Improving forage for pollinators in the last frontier of the commercial beekeeping industry. **Clint Otto** (cotto@usgs.gov)[1], Haochi Zheng[2], Ben Carlson[1], Rich Iovanna[3], Alisa Gallant[4], Skip Hyberg[3] and Katie Lamke[5], [1]U.S. Geological Survey, Jamestown, ND, [2]Univ. of North Dakota, Grand Forks, ND, [3]USDA - Farm Services Agency, Washington, DC, [4]U.S. Geological Survey, Sioux Falls, SD, [5]Univ. of Nebraska, Lincoln, NE

11:35 **SP1876** Wet meadow restoration buffers the impact of climate change: Pollinator resilience during the California drought. **Jennifer VanWyk** (vanwyk@ucdavis.edu)[1,2] and Neal M. Williams[1], [1]Univ. of California, Davis, CA, [2]California State Univ., Chico, CA

11:45 **Concluding Remarks**

Member Symposium: Systematics and Evolution of the Tenebrionoidea (Coleoptera)

Meeting Room 506 (Convention Center)

Moderators and Organizers: M. Andrew Johnston[1] and Kojun Kanda[2], [1]Arizona State Univ., Tempe, AZ, [2]Northern Arizona Univ., Flagstaff, AZ

8:00 **Introductory Remarks**

8:05 **1877** Descriptions of the larva, pupa, habitats and life history of the North American darkling beetle *Idiobates castaneus* (Knoch) (Coleoptera: Tenebrionidae; Tenebrionini). **Warren E. Steiner** (steinerw@si.edu), Smithsonian Institution, Washington, DC

8:20 **1878** Towards a taxonomic revision of *Hypogena* (Tenebrionidae: Coleoptera). **Beauchamp Thomas** (bat238@nau.edu) and Aaron Smith, Northern Arizona Univ., Flagstaff, AZ

8:35 **1879** Revision of *Cryptozoon* Schaufuss, 1882 (Coleoptera: Tenebrionidae: Anopidiina). **Erich Spiessberger** (anopidiina@gmail.com), Montana State Univ., Bozeman, MT

8:50 **1880** Revision of the genus *Ulus* Horn (Coleoptera: Tenebrionidae), with a preliminary phylogeny of the Blapstinina. **Ryan Lumen** (hasti152@d.umn.edu)[1], Marcin Kaminski[2], Kojun Kanda[3] and Aaron Smith[3], [1]Univ. of Minnesota, Duluth, MN, [2]Polish Academy of Sciences, Warsaw, Poland, [3]Northern Arizona Univ., Flagstaff, AZ

9:05 **1881** The root (?) of the Tenebrionidae: Cnemeplatiini, higher classification changes, revisions, new species and biology. **Rolf Aalbu** (raalbu@comcast.net)[1], Michael Caterino[2], Kojun Kanda[3] and Aaron Smith[3], [1]California Academy of Sciences, San Francisco, CA, [2]Clemson Univ., Clemson, SC, [3]Northern Arizona Univ., Flagstaff, AZ

9:20 **1882** A preliminary phylogeny of the Edrotini (Coleoptera: Tenebrionidae). **Christopher Wirth** (christophercwirth@gmail.com) and Aaron Smith, Northern Arizona Univ., Flagstaff, AZ

9:35 **1883** Areas of endemism in the arid Southwest: Insights from *Trogloderus* and related Psammophiles (Coleoptera: Tenebrionidae). **M. Andrew Johnston** (ajohnston@asu.edu), Arizona State Univ., Tempe, AZ

9:50 **Break**

10:05 **1884** Tenebrionidae diversity and novel bioblitz collecting techniques in Belize. **M. Fran Keller** (mfkeller@ucdavis.edu), Bohart Museum of Entomology, Davis, CA

10:20 **1885** Towards a phylogenomic analyses of Pimeliinae. **Kojun Kanda** (kojun.kanda@nau.edu) and Aaron Smith, Northern Arizona Univ., Flagstaff, AZ

10:35 **1886** Living on the edge: Shelf fungus habitation in the Tenebrionidae. **Aaron Smith** (aaron.smith@nau.edu), Kojun Kanda and Beauchamp Thomas, Northern Arizona Univ., Flagstaff, AZ

10:50 **1887** Phylogeny of the tribe Pedinini (Coleoptera: Tenebrionidae) and its implications for higher-level classification. **Marcin Kaminski** (mkaminski@miiz.waw.pl)[1], Kojun Kanda[2], Dariusz Iwan[1], Aaron Smith[2] and Ryan Lumen[3], [1]Polish Academy of Sciences, Warsaw, Poland, [2]Northern Arizona Univ., Flagstaff, AZ, [3]Univ. of Minnesota, Duluth, MN

11:05 **1888** An update on the phylogeny and constitution of Zopheridae. **Nathan Lord** (bothriderid@gmail.com)[1], Richard A. B. Leschen[2] and Michael Ivie[3], [1]Georgia College, Milledgeville, GA, [2]Landcare Research, Auckland, New Zealand, [3]Montana State Univ., Bozeman, MT

11:20 **1889** Catalogue of Tenebrionidae (Insecta: Coleoptera) of North America. **Pat Bouchard** (patrice.bouchard@agr.gc.ca)[1], Yves Bousquet[1], Donald B. Thomas[2], Aaron D. Smith[3], Rolf Aalbu[4], M. Andrew Johnston[5] and Warren E. Steiner[6], [1]Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, ON, Canada, [2]USDA - ARS, Edinburg, TX, [3]Northern Arizona Univ., Flagstaff, AZ, [4]California Academy of Sciences, San Francisco, CA, [5]Arizona State Univ., Tempe, AZ, [6]Smithsonian Institution, Washington, DC

11:35 **Concluding Remarks**

Organized Meeting: WERA 1021: Multi-State Research Collaborations Inspire Spotted Wing Drosophila, *Drosophila suzukii*, Management Innovations

Meeting Room 702 (Convention Center)

Moderator and Organizer: Kelly Hamby, Univ. of Maryland, College Park, MD

8:00 **Introductory Remarks**

8:05 **1890** The salt test method: An efficient tool to monitor for spotted wing drosophila infestation in fruit. **Lauren Diepenbrock** (laurendiepenbrock@gmail.com)[1], Steven Van Timmeren[2], Matt Bertone[1], Hannah Burrack[1] and Rufus Isaacs[2], [1]North Carolina State Univ., Raleigh, NC, [2]Michigan State Univ., East Lansing, MI

8:20 **Salt test method discussion**

8:35 **1891** A semi-field bioassay protocol for assessing the effectiveness of field-aged insecticides against spotted-wing drosophila. **Steven Van Timmeren** (vantimm2@msu.edu) and Rufus Isaacs, Michigan State Univ., East Lansing, MI

8:50 **Discussion of semi-field bioassays**

9:05 **1892** Protocols for screening spotted wing drosophila field populations for insecticide resistance. **Ashfaq Sial** (ashsial@uga.edu), Univ. of Georgia, Athens, GA

9:20 **Discussion of protocols for insecticide resistance screening**

9:35 **State impact statement reports poster session**

10:35 **1893** Sustainable spotted wing drosophila management in U.S. fruit crops: Year 2 update. **Hannah Burrack** (hannah_burrack@ncsu.edu)[1], Joanna Chiu[2], Kent Daane[3], Miguel Gomez[4], Larry Gut[5], Rufus Isaacs[5], Gregory Loeb[6], Cesar Rodriguez-Saona[7], Ashfaq Sial[8], Vaughn Walton[9] and Frank Zalom[2], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of California, Davis, CA, [3]Univ. of California, Parlier, CA, [4]Cornell Univ., Ithaca, NY, [5]Michigan State Univ., East Lansing, MI, [6]Cornell Univ., Geneva, NY, [7]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [8]Univ. of Georgia, Athens, GA, [9]Oregon State Univ., Corvallis, OR

10:50 **1894** Development and implementation of systems-based organic management strategies for spotted wing drosophila: An OREI project update. Ashfaq Sial[1], **Rufus Isaacs** (isaacsr@msu.edu)[2], Matt Grieshop[2], Christelle Guédot[3], Kelly Hamby[4], Vaughn Walton[5], Mary Rogers[6] and Hannah Burrack[7], [1]Univ. of Georgia, Athens, GA, [2]Michigan State Univ., East Lansing, MI, [3]Univ. of Wisconsin, Madison, WI, [4]Univ. of Maryland, College Park, MD, [5]Oregon State Univ., Corvallis, OR, [6]Univ. of Minnesota, St. Paul, MN, [7]North Carolina State Univ., Raleigh, NC

11:05 **1895** Developing research strategies for spotted wing drosophila: Learning from the past and building for the future. **Justin Renkema** (justin.renkema@ufl.edu), Univ. of Florida, Wimauma, FL

11:20 **Research priorities discussion**

11:55 **Concluding Remarks**

10-min: MUVE, Vector Surveillance

Meeting Room 503 (Convention Center)

Moderators: Tovi Lehmann[1] and Chelsea Smartt[2], [1]National Institutes of Health, Rockville, MD, [2]Univ. of Florida, Vero Beach, FL

8:00 **1896** Windborne long-distance migration of malaria mosquitoes in the Sahel: Where do they come from? **Tovi Lehmann** (tlehmann@niaid.nih.gov)[1], Alpha Yaro[2], Moussa Diallo[2], Zana Sanogo[3], Samake Djibril[2], Diana L. Huestis[1], Roy Faiman[1], Jenna Florio[1], Asha Krishna[1], Benjamin Krajacich[1], Laura Veru[1], Jason Chapman[4], Don Reynolds[5], David Weetman[6], Martin Donnelly[6], Maria Lourdes Chamorro[7], Elijah Talamas[7], Yvonne-Marie Linton[8], Udi Strobach[9] and Adama Dao[3], [1]National Institutes of Health, Rockville, MD, [2]International Center for Excellence in Research, Bamako, Mali, [3]Malaria Research and Training Center, Bamako, Mali, [4]Rothamsted Research, Harpenden, United Kingdom, [5]Univ. of Greenwich, Chatham, United Kingdom, [6]Liverpool School of Tropical Medicine, Liverpool, United Kingdom, [7]USDA - ARS, Washington, DC, [8]Walter Reed Biosystematics Unit, Suitland, MD, [9]National Oceanic and Atmospheric Administration, College Park, MD

8:10 **1897** Assessing the contribution of aestivation to persistence of African malaria mosquitoes in the Sahel using stable isotopes. **Roy Faiman** (roy.faiman@nih.gov)[1], Adama Dao[2], Alpha Yaro[2], Moussa Diallo[2], Zana Sonogo[3], Yossi Ousmane[3], Samake Djibril[2], Keith Hobson[4], Gabriel Hamer[5], Christine France[6] and Tovi Lehmann[1], [1]National Institutes of Health, Rockville, MD, [2]International Center for Excellence in Research, Bamako, Mali, [3]Vectors and Vector Borne Diseases, Bamako, Mali, [4]Univ. of Western Ontario, London, ON, Canada, [5]Texas A&M Univ., College Station, TX, [6]Smithsonian Institution, Suitland, MD

8:20 **1898** Development of a portable carbon dioxide (CO_2) generator for vector surveillance. **Brady Clapsaddle** (bclapsaddle@tda.com)[1], William Bell[1], Joe Fredrickson[2], Trevor Haanstad[1] and Dana Focks[3], [1]TDA Research, Inc, Wheat Ridge, CO, [2]LE Invention Services, LLC, Denver, CO, [3]John W. Hock Company, Gainesville, FL

8:30 **1899** Free-flight behavior of *Culex quinquefasciatus* to carbon dioxide in a wind tunnel. **Emerson Lacey** (eslacey@ucr.edu) and Ring T. Cardé, Univ. of California, Riverside, CA

8:40 **1900** Breeding sites of *Aedes aegypti*: Potential dengue vectors in Dire Dawa, East Ethiopia. **Habte Tekie** (habte_tm@yahoo.com)[1], Dejene Getachew[1,2], Teshome Gebre_Michael[1], Meshesha Balkew[1] and Akalu Mesfin[2], [1]Addis Ababa Univ., Addis Ababa, Ethiopia, [2]Dire Dawa Univ., Dire Dawa, Ethiopia

8:50 **1901** Differentiation of mosquito community by urban area and climate division in Oklahoma. **Bruce Noden** (bruce.noden@okstate.edu)[1], David Bradt[1], Kristy Bradley[2] and W. Wyatt Hoback[1], [1]Oklahoma State Univ., Stillwater, OK, [2]Oklahoma Dept. of Health, Oklahoma City, OK

9:00 **1902** *Aedes aegypti* population age structure as a measure of vectorial capacity along the Arizona/Sonora border region. **Kathleen Walker** (krwalker@cals.arizona.edu)[1], Teresa K Joy[1], Michael A. Riehle[1], Kacey Ernst[1] and Mecedes Gameros[2], [1]Univ. of Arizona, Tucson, AZ, [2]Hospital General, Heroica Nogales, Mexico

9:10 **1903** Surveillance of mosquito populations and the occurrence of nematodes and *Wolbachia* infections in Hall County, Georgia. **Davison Sangweme** (davison.sangweme@ung.edu)[1] and Evan Lampert[2], [1]Univ. of North Georgia, Gainesville, GA, [2]Univ. of North Georgia, Oakwood, GA

9:20 **1904** *Aedes albopictus*: An underestimated enemy to the French forces in Gabon? **Franck Berger** (franckdesp@gmail.com)[1], Madjid Mokrane[1], Jean-Michel Berenger[2], Isabelle Leparc-Goffart[3] and Sébastien Briolant[3], [1]Centre d'Épidémiologie et de Santé Publique des Armées, Marseille, France, [2]Aix-Marseille Univ. Hospital, Marseille, France, [3]Institut de Recherche Biomédicale des Armées, Marseille, France

9:30 **Break**

9:40 **1905** Evidence of Zika virus RNA fragments in *Aedes albopictus* (Diptera: Culicidae) field collected eggs from Camaçari, Bahia, Brazil. **Chelsea T. Smartt** (ctsmart@ufl.edu)[1], Tanise Stenn[1], Tse-Yu Chen[1], Maria Gloria Teixeira[2], Erivaldo P. Queiroz[3], Luciano Souza Dos Santos[4], Gabriel A. N. Queiroz[5], Kathleen Ribeiro Souza[5], Luciano Kalabric Silva[5], Dongyoung Shin[1] and Walter J. Tabachnick[1], [1]Univ. of Florida, Vero Beach, FL, [2]Univ. Federal da Bahia, Salvador, Brazil, [3]Salvador Health Municipal Secretary, Salvador, Brazil, [4]Botanical Gardens of Salvador, Salvador, Brazil, [5]Fundação Oswaldo Cruz, Salvador, Brazil

9:50 **1906** Genetic variability of *Aedes aegypti* (Linnaeus) in El Salvador. **Andrea Joyce** (ajoyce2@ucmerced.edu)[1] and Melany Murillo Torres[2], [1]Univ. of California, Merced, CA, [2]Univ. de El Salvador, San Salvador, El Salvador

10:00 **1907** Evaluation of the GEN COI "barcode" in mosquitoes of medical importance in Córdoba, Colombia. **Angie Toro** (angiecantillo09@gmail.com)[1] and Richard Hoyos[2], [1]Univ. de Pamplona, Norte de Santander, Colombia, [2]Univ. del Sinu, Montería, Colombia

10:10 **1908** Repurposing targeted sequencing data to update a species identification assay for the *Culex pipiens* complex of vector mosquitoes. **Linda Kothera** (lkothera@cdc.gov) and Harry Michael Savage, Centers for Disease Control and Prevention, Fort Collins, CO

10:20 **1909** Interrogation of the seasonal microbiome of *Anopheles coluzzii* in Mali. **Benjamin Krajacich** (benjamin.krajacich@nih.gov)[1], Diana L. Huestis[1], Adama Dao[2], Alpha Yaro[2], Moussa Diallo[2], Asha Krishna[1], Jiannong Xu[3] and Tovi Lehmann[1], [1]National Institutes of Health, Rockville, MD, [2]International Center for Excellence in Research, Bamako, Mali, [3]New Mexico State Univ., Las Cruces, NM

10:30 **1910** Genetic diversity of *Anopheles triannulatus* (Diptera: Culicidae) in areas with high incidence for malaria in Cordoba, Colombia. **Maria Atencia** (mariclau_1112@hotmail.com) and Richard Hoyos, Univ. del Sinu, Montería, Colombia

10:40 **1911** Genetic diversity of *Plasmodium vivax* merozoite surface protein 3α and β field isolates of Azad Jammu and Kashmir from Pakistan. **Nargis Shaheen** (nargisshaheen555@gmail.com), Muhammad Afzal, Naveeda Qureshi and Huma Fatima, Quaid-i-Azam Univ., Islamabad, Pakistan

10:50 **1912** DNA barcoding of Phlebotominae species (Diptera: Psychodidae) in endemic zones of the cutaneous leishmaniasis from Cordoba (Colombia). **Richard Hoyos** (rhoyoslopez@gmail.com), Univ. del Sinu, Montería, Colombia

11:00 **1913** Entomological evaluation by dissection of adult *Simulium damnosum* complex for larvae of *Onchocerca volvulus* following CDTI in Amagu Agba Community, Ishielu l.g.a. Ebonyi State, Nigeria. **Raymond Nnadozie** (augustinennadozie2@gmail.com)[1], Emmanuel Onyenwe[2], Oghale Okore[2] and Amarachi Okorie[2], [1]Federal Univ. of Technology, Owerri, Nigeria, [2]Michael Okpara Univ. of Agriculture, Umuahia, Nigeria

11:10 **1914** *Paederus* dermatitis: An epidemic study with haematological changes in girls at girl's hostel of Bahauddin Zkariya University, Multan, Pakistan. **Muhammad Nazir** (mudasser.nazir@bzu.edu.pk)[1], Masood Akhtar[1], Muhammad Ayaz[1], Muhammad Oneeb[2], Atif Ahmad[1] and Noman Nazir[3], [1]Bahauddin Zakariya Univ., Multan, Pakistan, [2]Univ. of Veterinary and Animal Sciences, Lahore, Pakistan, [3]Shifa International Hospital, Islamabad, Pakistan

10-min: P-IE, Behavior

Meeting Room 504 (Convention Center)

Moderators: Felix Cervantes[1] and Jesus Esquivel[2], [1]USDA - ARS, Parlier, CA, [2]USDA - ARS, College Station, TX

8:00 **1915** Tracking free-flying insects in the field in three dimensions. **Michael Caprio** (mcaprio@entomology.msstate.edu), Mississippi State Univ., Mississippi State, MS

8:10 **1916** *Bactrocera cucurbitae* and *Bactrocera dorsalis* (Diptera: Tephritidae) females differ in their visual and olfactory responses to a (un)common host fruit, *Carica papaya* L (Caricaceae). **Steven Souder** (steven.souder@ars.usda.gov)[1,2], Jaime Pinero[3], Helen Spafford[1] and Roger Vargas[2], [1]Univ. of Hawai'i, Honolulu, HI, [2]USDA - ARS, Hilo, HI, [3]Lincoln Univ., Jefferson City, MO

8:20 **1917** Plant defense elicitors influence host searching behavior in swede midge, *Contarninia nasturtii* (Kieffer) (Diptera: Cecidomyiidae). **Paolo Filho** (paolo.filho@uvm.edu), Chase Stratton, Elisabeth Hodgdon and Yolanda Chen, Univ. of Vermont, Burlington, VT

8:30 **1918** Exploring behavioral landscape ecology in monarch butterflies (*Danaus plexippus*) with a spatially-explicit agent-based model. **Tyler Grant** (tgrant@iastate.edu)[1], Hazel R. Parry[2], Myron Zalucki[3] and Steven Bradbury[1], [1]Iowa State Univ., Ames, IA, [2]CSIRO, Brisbane, Australia, [3]Univ. of Queensland, Brisbane, Australia

8:40 **1919** Influence of host plant on wind dispersal by an eriophyid mite, *Aceria salsola*. **Lincoln Smith** (link.smith@ars.usda.gov), USDA - ARS, Montferrier-sur-Lez, France

8:50 **1920** Impact of soybean vein necrosis virus on life table of its vector sp. *Neohydatothrips variabilis* (Beach). **Asifa Hameed** (akh5405@psu.edu), Istvan Miko, Cristina Rosa and Edwin Rajotte, Pennsylvania State Univ., University Park, PA

9:00 **1921** EPG waveforms of blue-green sharpshooter: Impedance and voltage levels effects on stylet probing. **Felix Cervantes** (felix.cervantes@ars.usda.gov) and Elaine Backus, USDA - ARS, Parlier, CA

9:10 **Break**

9:20 **1922** Interactions and behavior of *Spodoptera frugiperda* with *Helicoverpa* spp. on corn. **José Bentivenha** (jpbentivenha@gmail.com)[1], Débora Montezano[2], Edson Baldin[3], Silvana Paula-Moraes[4], Julie Peterson[5] and Thomas Hunt[6], [1]Univ. de São Paulo, Piracicaba, Brazil, [2]Univ. of Nebraska, Lincoln, NE, [3]Univ. Estadual Paulista, Botucatu, Brazil, [4]Univ. of Florida, Jay, FL, [5]Univ. of Nebraska, North Platte, NE, [6]Univ. of Nebraska, Concord, NE

9:30 **1923** The monitoring and oviposition behavior of *Sirex noctilio* (Hymenoptera: Siricidae) in China. **Qiang Xu** (xuqiangbj@foxmail.com) and Juan Shi, Beijing Forestry Univ., Beijing, China

9:40 **1924** Asynchrony between initial mating behavior and mature reproductive systems in southern green stink bug. **Jesus F. Esquivel** (jesus.esquivel@ars.usda.gov), USDA - ARS, College Station, TX

9:50 **1925** Behavioral changes in *Diaphorina citri* associated with host switching. **Timothy Ebert** (tebert@ufl.edu) and Michael Rogers, Univ. of Florida, Lake Alfred, FL

10:00 **1926** Predator movement in winter canola agrolandscapes of the southern Plains. **Casi Jessie** (casi.jessie@gmail.com)[1], Kris Giles[1], Brian McCornack[2], William Jessie[1], James Hagler[3] and Tim Kring[4], [1]Oklahoma State Univ., Stillwater, OK, [2]Kansas State Univ., Manhattan, KS, [3]USDA - ARS, Maricopa, AZ, [4]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

10:10 **1927** Dispersal behavior and capacity of *Halyomorpha halys* (Hemiptera: Pentatomidae) reared on host plants of different suitability. **Angelita Acebes-Doria** (aacebes@vt.edu)[1,2], Tracy C. Leskey[2] and Christopher Bergh[3], [1]Virginia Polytechnic Instititue and State Univ. & USDA - ARS, Kearneysville, WV, [2]USDA - ARS, Kearneysville, WV, [3]Virginia Polytechnic Institute and State Univ., Winchester, VA

10:20 **1928** Seasonal activity of spotted wing drosophila, *Drosophila suzukii* Matsumura (Diptera: Drosophilidae), in small fruit production sites in North Dakota. **Caitlin Krueger** (c.krueger@ndsu.edu)[1], Janet Knodel[1], Esther McGinnis[1], Harlene Hatterman-Valenti[1] and Kathy Wiederholt[2], [1]North Dakota State Univ., Fargo, ND, [2]North Dakota State Univ., Carrington, ND

10-min: P-IE, Biocontrol, General

Meeting Room 507 (Convention Center)

Moderators: Rebeccah A. Waterworth[1] and Elson J. Shields[2], [1]Univ. of Maryland, College Park, MD, [2]Cornell Univ., Ithaca, NY

8:00 **1929** First field release of a shoot tip-galling fly (*Parafreutreta regalis*) along the California coast, a biological control for Cape-ivy (*Delairea odorata*). **Scott Portman** (slportman37@gmail.com) and Patrick Moran, USDA - ARS, Albany, CA

8:10 **1930** Hybridization of two biotypes of *Lilioceris cheni* will not hinder biological control of air potato, *Dioscorea bulbifera*. **Ellen Lake** (ellen.lake@ars.usda.gov)[1], Melissa Smith[1], William A. Overholt[2], Rodrigo Diaz[3], Veronica Manrique[3], F. Allen Dray Jr.[4], Eric Rohrig[5] and Paul Pratt[6], [1]USDA - ARS, Fort Lauderdale, FL, [2]Univ. of Florida, Fort Pierce, FL, [3]Louisiana State Univ., Baton Rouge, LA, [4]USDA - ARS, Davie, FL, [5]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL, [6]USDA - ARS, Albany, CA

8:20 **1931** Predicting spillover risk to non-target plants pre-release: *Bikasha collaris* a potential biological control agent of Chinese tallowtree (*Triadica sebifera*). **Gregory S. Wheeler** (greg.wheeler@ars.usda.gov)[1] and Susan Wright[2], [1]USDA - ARS, Fort Lauderdale, FL, [2]USDA - ARS, Gainesville, FL

8:30 **1932** Biological control of the invasive water hyacinth, *Eichhornia crassipes*, by two weevils (*Neochetina* spp.) in the Sacramento-San Joaquin river delta, California: Current status and limitations. **Julie Hopper** (jvhopper@ucdavis.edu)[1], Edwin Grosholz[1] and Paul Pratt[2], [1]Univ. of California, Davis, CA, [2]USDA - ARS, Albany, CA

8:40 **1933** Interactions between two biological control agents on an invasive fern, *Lygodium microphyllum*. **Ian Jones** (ian.jones@ars.usda.gov) and Ellen Lake, USDA - ARS, Fort Lauderdale, FL

8:50 **1934** Presentation withdrawn

9:00 **1935** Biological control of Russian knapweed (*Rhaponticum repens*) in Colorado. **Joel Price** (joel.price@state.co.us), Colorado Dept. of Agriculture, Palisade, CO

9:10 **1936** Select flowering plants: Can they increase natural enemies and biological control services in ornamental systems? **Rebeccah A. Waterworth** (rwater@umd.edu) and Paula M. Shrewsbury, Univ. of Maryland, College Park, MD

9:20 **Break**

9:30 **1937** Are entomopathogenic nematodes associated with differences in grape root borer infestations among Virginia vineyards? **Christopher Bergh** (cbergh@vt.edu)[1] and Glen Stevens[2], [1]Virginia Polytechnic Institute and State Univ., Winchester, VA, [2]Ferrum College, Ferrum, VA

9:40 **1938** Two mating disruption formulations for control of row crop pests, fall armyworm (*Spodoptera frugiperda*) and Old World bollworm (*Helicoverpa armigera*). **William Urrutia** (william.urrutia@iscatech.com)[1], Agenor Mafra-Neto[1], Rafael Borges[2], Leandro Mafra[2], Rodrigo Silva[1], Carmem Bernardi[1] and Jesse Saroli[1], [1]ISCA Technologies, Inc, Riverside, CA, [2]ISCA Tecnologias Ltda, Ijui, Brazil

9:50 **1939** Intra-specific variation in defense determines predator community composition. **Paul Lenhart** (palenhart@uky.edu) and Jennifer A. White, Univ. of Kentucky, Lexington, KY

10:00 **1940** EPN multi-year persistence across NY crop rotations: Changing the biocontrol paradigm? **Elson J. Shields** (es28@cornell.edu) and Antonio Testa, Cornell Univ., Ithaca, NY

10:10 **1941** Movement and survival of *Larinus minutus* in response to roadside mowing. **Beth Ferguson** (mef005@email.uark.edu)[1], Robert N. Wiedenmann[1] and Tim Kring[2], [1]Univ. of Arkansas, Fayetteville, AR, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

10:20 **1942** Noctovi: A sprayable attract and kill product for noctuid moth pests. **Agenor Mafra** (agenor1@iscatech.com)[1], Rafael Borges[2], Leandro Mafra[2], Jesse Saroli[1], William Urrutia[1], Rodrigo Silva[1] and Carmem Bernardi[1], [1]ISCA Technologies, Inc, Riverside, CA, [2]ISCA Tecnologias Ltda, Ijui, Brazil

10:30 **1943** Presentation withdrawn

10:40 **1944** Sterile insect release for suppression of codling moth (*Cydia pomonella*) in Michigan apple orchards. **Christopher Adams** (adamsch@msu.edu) and Larry Gut, Michigan State Univ., East Lansing, MI

10:50 **1945** CropCoat™: A new tool for environmentally friendly crop protection. **Kavita Sharma** (ksharma@crop-enhancement.com)[1], Ki Kim[2], Saripah Bakar[3], Turner Newton[1], Rodrigo Telles[1], Matthew Bosley[1], Rosa Casado[1], Robert Mahoney[1], Damian Hajduk[1], Kevin Chen[1] and David Soane[1], [1]Crop Enhancement, Inc, Cambridge, MA, [2]Florida Ag Research, Thonotosassa, FL, [3]Malaysian Cocoa Board, Sabah, Malaysia

10-min: P-IE, Host Plant Resistance

Meeting Room 710 (Convention Center)

Moderators: Xiaoyan Cheng[1] and Flor E. Acevedo[2], [1]Kansas State Univ., Manhattan, KS, [2]Pennsylvania State Univ., University Park, PA

8:00 **1946** Comparative transcriptomics of *Diuraphis noxia* and *Schizaphis graminum* fed wheat genotypes with different aphid-resistance genes. Lina Aguirre-Rojas[1], Erin Scully[2], Laramy Enders[3] and **C. Michael Smith** (cmsmith@ksu.edu)[1], [1]Kansas State Univ., Manhattan, KS, [2]USDA - ARS, Manhattan, KS, [3]Purdue Univ., West Lafayette, IN

8:10 **1947** Transcriptome analysis of *Aphis gossypii* provides an insight into the modified phenotype associated with *Vat*-mediated resistance. **Sampurna Sattar** (sus56@psu.edu)[1], Charles Addo-Quaye[2] and Gary A. Thompson[1], [1]Pennsylvania State Univ., University Park, PA, [2]Lewis-Clark State College, Lewistown, ID

8:20 **1948** Can avirulent aphids persistent on resistant soybeans when exposed to natural enemies? **Matthew Kaiser** (mckaiser@iastate.edu)[1], Matthew O'Neal[1] and Andrew Michel[2], [1]Iowa State Univ., Ames, IA, [2]The Ohio State Univ., Wooster, OH

8:30 **1949** Antibiosis to *Brevicoryne brassica* (L.) (Hemiptera: Aphididae) in kale germplasm. **Vinícius Canassa** (vfcanassa@hotmail.com)[1], Edson Baldin[1], Georgea Domingos[1], Matheus Sacilotto[1], André Lourenção[2] and J. P. Michaud[3], [1]Univ. Estadual Paulista, Botucatu, Brazil, [2]Agronomic Institute of Campinas, Campinas, Brazil, [3]Kansas State Univ., Hays, KS

8:40 **1950** Efficacy of new canola cultivers against canola aphid on the basis of their biochemical analysis. **Nasir Masood** (nasirmasood2004@yahoo.com), Comsats Institute of Information Technology, Vehari, Pakistan

8:50 **1951** Changes in sorghum transcriptome in response to sugarcane aphid herbivory. **Mahnaz Kiani** (mhkiani@tamu.edu) and Ada Szczepaniec, Texas A&M Univ., Amarillo, TX

9:00 **1952** BIK1, a Botrytis-induced kinase, modulates *Arabidopsis* resistance against aphids via PAD4. **Keyan Zhu-Salzman** (ksalzman@tamu.edu), Texas A&M Univ., College Station, TX

9:10 **Break**

9:20 **1953** Plant mineral defense against insect herbivores. **Flor E. Acevedo** (fea5007@psu.edu)[1], Michelle Peiffer[1], Ching-Wen Tan[1], Swayamjit Ray[1], Ju-Che Lo[1], Dean Taylor[1], Loren Rivera-Vega[1], Yuhao Huang[1], Jie Wang[2] and Gary Felton[1], [1]Pennsylvania State Univ., University Park, PA, [2]Fujian Agriculture and Forestry Univ., Fuzhou, China

9:30 **1954** *Helicoverpa zea* gut-associated bacteria indirectly induce defenses in tomato by triggering a salivary elicitor(s). **Jie Wang** (jiewang0813@163.com)[1], Gary Felton[2] and Rensen Zeng[1], [1]Fujian Agriculture and Forestry Univ., Fuzhou, China, [2]Pennsylvania State Univ., University Park, PA

9:40 **1955** Evaluation of fall armyworm and corn earworm damage and aflatoxin accumulation in the intermated B73 x Mo17 maize population. **Xinzhi Ni** (xinzhi.ni@ars.usda.gov)[1], W. Paul Williams[2], Wenwei Xu[3] and G. David Buntin[4], [1]USDA - ARS, Tifton, GA, [2]USDA - ARS, Mississippi State, MS, [3]Texas A&M Univ., Lubbock, TX, [4]Univ. of Georgia, Griffin, GA

9:50 **1956** Evaluation for resistance of some maize genotypes to the African bollworm, *Helicoverpa armigera* (Hübner) in the Gezira and River Nile states, Sudan. **Faiza Salah** (faizaruba@yahoo.com), Univ. of Gezira, Wad Medani, Sudan

10:00 **1957** Plant defense traits against specialist and generalist herbivores within the model organism *Mimulus guttatus*. **Michael Rotter** (mcr268@nau.edu), Northern Arizona Univ., Flagstaff, AZ

10:10 **Break**

10:20 **1958** Antixenosis of soybean genotypes to the sweetpotato whitefly, *Bemisia tabaci* biotype B. **Edson Baldin** (elbaldin@fca.unesp.br)[1], Patrícia Cruz[1], Rafaela Morando[1], Ivana F. da Silva[1] and José Bentivenha[2], [1]Univ. Estadual Paulista, Botucatu, Brazil, [2]Univ. de São Paulo, Piracicaba, Brazil

10:30 **1959** A large family of genes transferred into Hessian fly belongs to a novel glycoside hydrolase family. **Xiaoyan Cheng** (xycheng@ksu.edu)[1], Sandra Carrera[1], R. Jeff Whitworth[1], Yoonseong Park[1], Jeffrey J. Stuart[2] and Ming-Shun Chen[1], [1]Kansas State Univ., Manhattan, KS, [2]Purdue Univ., West Lafayette, IN

10:40 **1960** Chemical cues from beneficial entomopathogenic nematodes enhance plant protection against herbivores. **Anjel Helms** (amh468@psu.edu), Swayamjit Ray, Nina Matulis, Margaret Kuzemchak, Elizabeth Davidson-Lowe and Jared Ali, Pennsylvania State Univ., University Park, PA

10:50 **1961** Caging gall insects in the field: Clonal plant traits impact insect establishment. **Theresa Barosh** (theresa.barosh@colostate.edu), Alexa Weiand and Paul Ode, Colorado State Univ., Fort Collins, CO

11:00 **1962** Phylogenetic signal missing from arthropod communities on native Australian trees. **Erin Leckey** (erin.leckey@colorado.edu)[1], Dieter Hochuli[2] and Margot Law[2], [1]Univ. of Colorado, Boulder, CO, [2]Univ. of Sydney, Sydney, Australia

11:10 **1963** Chitinases in caterpillar frass alter plant volatile profiles and influence performance of a subsequent herbivore. **Swayamjit Ray** (szr146@psu.edu), Anjel Helms, Nina Matulis, Gary Felton, Dawn Luthe and Jared Ali, Pennsylvania State Univ., University Park, PA

10-min: P-IE, Invasive Species 2

Meeting Room 705 (Convention Center)

Moderators: Byju Nambidiyattil Govind[1] and James Radl[2], [1]Univ. of Minnesota, St. Paul, MN, [2]The Ohio State Univ., Columbus, OH

8:00 **1964** Effect of plant extract *Ruta chalepensis* against the whitefly, *Bemisia tabaci* (Homoptera: Aleyrodidae), at Biskra oasis, Algeria. **Nacer Tarai** (tarainacer@yahoo.fr), Univ. de Biskra, Biskra, Algeria

8:10 **1965** Phenology and life table studies of a Minnesota acclimated population of the brown marmorated stink bug. **Byju Nambidiyattil Govind** (ngbyju@gmail.com)[1], Eric C. Burkness[1], William Hutchison[1], Robert Koch[1], Christopher R. Philips[1], Tracy Twine[1], Peter Snyder[1] and Mark Abrahamson[2], [1]Univ. of Minnesota, St. Paul, MN, [2]Minnesota Dept. of Agriculture, St. Paul, MN

8:20 **1966** Phenology and infestation of brown marmorated stink bug in fruit and nut crops in the north San Joaquin Valley, California. **Jhalendra Rijal** (jrijal@ucdavis.edu), Univ. of California Cooperative Extension, Modesto, CA

8:30 **1967** Studies on critical diapause termination cues in *Halyomorpha halys*. **Anne Nielsen** (nielsen@aesop.rutgers.edu)[1], Emily Ogburn[2] and James F. Walgenbach[2], [1]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ, [2]North Carolina State Univ., Mills River, NC

8:40 **1968** Reduced insecticide management strategies for brown marmorated stink bug in apples. **Brent Short** (brent.short@ars.usda.gov) and Tracy C. Leskey, USDA - ARS, Kearneysville, WV

8:50 **1969** The impact of temperature and humidity on the brown marmorated stink bug, *Halyomorpha halys* in California. **Joanna Fisher** (jfisher@ucdavis.edu)[1], Chuck Ingels[2], Jhalendra Rijal[3] and Frank Zalom[1], [1]Univ. of California, Davis, CA, [2]Univ. of California Cooperative Extension, Sacramento, CA, [3]Univ. of California Cooperative Extension, Modesto, CA

9:00 **1970** Pentatomid diversity in mid-Atlantic blacklight traps post-*Halyomorpha halys* invasion. **Joe Kaser** (joe.kaser@rutgers.edu)[1], George C. Hamilton[1] and Anne Nielsen[2], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ

9:10 **1971** Developing sensitive and cost-effective biosurrveillance and monitoring systems for the invasive brown marmorated stink bug, *Halyomorpha halys*. **Tracy C. Leskey** (tracy.leskey@ars.usda.gov)[1], Brent Short[1], Rob Morrison[2], Kevin Rice[1] and Thomas Kuhar[3], [1]USDA - ARS, Kearneysville, WV, [2]USDA - ARS, Manhattan, KS, [3]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

9:20 **Break**

9:30 **1972** Invasive pest and host plant dynamics across a heterogeneous landscape: Insights from area-wide monitoring of coffee berry borer on Hawai'i Island. **Melissa Johnson** (mjohnso8@hawaii.edu), Robert Hollingsworth and Nicholas Manoukis, USDA - ARS, Hilo, HI

9:40 **1973** Management of key insect pests of *Ficus* trees in Hawai'i. **Zhiqiang Cheng** (cheng241@hawaii.edu), Matthew Kellar and Bishnu Bhandari, Univ. of Hawai'i, Honolulu, HI

9:50 **1974** Using dendrochronology to reconstruct the spread of the Asian longhorned beetle *Anoplophora glabripennis* (Lamiinae: Monochamini) in Ohio. **Emily Franzen** (franzene2@xavier.edu)[1], Stephen Todd[1], Scott Gula[2], William Panagakos[3] and Ann M. Ray[1], [1]Xavier Univ., Cincinnati, OH, [2]Purdue Univ., West Lafayette, IN, [3]USDA - APHIS, Buzzards Bay, MA

10:00 **1975** Feeding preference of elm flea weevil (*Orchestes steppensis*) for elm cultivars. **James Radl** (radl.3@osu.edu) and David Shetlar, The Ohio State Univ., Columbus, OH

10:10 **1976** Assessment of the systems approach for the phytosanitary treatment of wood infested with invasive wood borers. **Chris MacQuarrie** (christian.macquarrie@canada.ca)[1], Robert Lavallée[2] and Leland Humble[3], [1]Natural Resources Canada, Sault Ste. Marie, ON, Canada, [2]Natural Resources Canada, Québec City, QC, Canada, [3]Natural Resources Canada, Victoria, BC, Canada

10:20 **1977** Fungi associate with *Acanthotomicus* sp. (Coleoptera: Curculionidae: Scolytinae), a destructive insect pest of North American sweetgum in China. **You Li** (yourreason@hotmail.com)[1], Yin-tse Huang[1], Lei Gao[2] and Jiri Hulcr[1], [1]Univ. of Florida, Gainesville, FL, [2]Shanghai Academy of Landscape Architecture Science and Planning, Shanghai, China

10:30 **1978** Olive bark beetle (*Phloeotribus scarabaeoides*) discovery in California and its potential impact. **Gevork Arakelian** (garakelian@acwm.lacounty.gov), Los Angeles County Dept. of Agricultural Commissioner, Weights and Measures, South Gate, CA

10:40 **1979** Morphometric and molecular characterization of Iroko gall bug, *Phytolyma* species (Psylidae: Hemiptera) from eastern and western Nigeria. **Juliana Ugwu** (dr.amaka2013@gmail.com)[1], Fedelis Ombura[2], Daisy Salifu[2] and Fathiya Khamis[2], [1]Forestry Research Institute of Nigeria, Ibadan, Nigeria, [2]International Centre of Insect Physiology and Ecology, Nairobi, Kenya

10-min: P-IE, Resistance Management

Meeting Room 405 (Convention Center)

Moderators: Mohammad-Amir Aghaee[1] and David Riley[2], [1]Univ. of California, Davis, CA, [2]Univ. of Georgia, Tifton, GA

8:00 **1980** About a beetle: The ecology and behavior of adult western corn rootworms in Bt cornfields. **Sarah Hughson** (sahughson@gmail.com) and Joseph Spencer, Univ. of Illinois, Champaign, IL

8:10 **1981** Detecting Bt resistance in Illinois western corn rootworm populations. **Joseph Spencer** (spencer1@illinois.edu), Nicholas Tinsley, Alexandra Kaluf, Ronald Estes, Michael Gray and Sarah Hughson, Univ. of Illinois, Champaign, IL

8:20 **1982** Laboratory-selected western corn rootworm colonies resistant to *Bt* and non-*Bt* transgenic corn plants. Amit Sethi, Jian-Zhou (Joe) Zhao, Stephen D. Thompson, Benchie Ortegon and **Ashley Miles** (ashley.miles@pioneer.com), DuPont Pioneer, Johnston, IA

8:30 **1983** Inheritance and fitness costs of Bt resistance in western corn rootworm. **Aaron J. Gassmann** (aaronjg@iastate.edu), Iowa State Univ., Ames, IA

8:40 **1984** The opportunities for management of Bt-resistant western corn rootworm: An experience from Iowa cornfields. **Ram B. Shrestha** (shrestrb@iastate.edu) and Aaron J. Gassmann, Iowa State Univ., Ames, IA

8:50 **1985** Rootworm resistance to Bt: An update. **Bruce Hibbard** (bruce.hibbard@ars.usda.gov)[1], Dalton Ludwick[2], Man Huynh[3], Adriano Pereira[2], Zixiao Zhao[2], Kent S. Shelby[1] and Thomas Coudron[1], [1]USDA - ARS, Columbia, MO, [2]Univ. of Missouri, Columbia, MO, [3]Can Tho Univ., Can Tho, Vietnam

9:00 **1986** Characterization of resistance to Cry1F δ-endotoxin in *Spodoptera frugiperda* populations from Argentina. **Desmi Chandrasena** (dichandrasena@dow.com)[1], Ana Signorini[2], Gustavo Abratti[3], Nicholas Storer[1], Magdalena Olaciregui[2], Analiza P. Alves[4] and Clinton Pilcher[4], [1]Dow AgroSciences, Indianapolis, IN, [2]Dow AgroSciences, Buenos Aires, Argentina, [3]DuPont Pioneer, Pergamino, Argentina, [4]DuPont Pioneer, Johnston, IA

9:10 **1987** Possible factors associated with resistance of fall armyworm to Bt crops. **Fangneng Huang** (fhuang@agcenter.lsu.edu), Louisiana State Univ., Baton Rouge, LA

9:20 **1988** Identification, inheritance, and cross-resistance of Vip3A resistance in a field-derived population of fall armyworm, *Spodoptera frugiperda*. **Fei Yang** (fyang@agcenter.lsu.edu)[1,2], Shannon Morsello[3], Graham P. Head[4], Fangneng Huang[1] and David Kerns[2], [1]Louisiana State Univ., Baton Rouge, LA, [2]Texas A&M Univ., College Station, TX, [3]Syngenta Crop Protection, Research Triangle Park, NC, [4]Monsanto Company, St. Louis, MO

9:30 **Break**

9:40 **1989** Investigation of southwestern corn borer (*Diatraea grandiosella*) resistance to Cry1F in Cochise, Arizona. **Andre Crespo** (andre.crespo@pioneer.com)[1], Jean Dyer[1], Dianna Gillespie[1], Carl Walker[1], Emily Huang[1], Marlin Rice[2] and Amit Sethi[1], [1]DuPont Pioneer, Johnston, IA, [2]Syngenta Crop Protection, Research Triangle Park, NC

9:50 **1990** Resistance is futile: Using patterns of *Helicoverpa zea* feeding on Bt cotton to develop a resistance monitoring tool. **Mohammad-Amir Aghaee** (maghaee@ncsu.edu)[1], Alejandro Del Pozo[1], Dominic Resig[1], Jeremy Greene[2], Jeff Gore[3] and Fred Musser[4], [1]North Carolina State Univ., Raleigh, NC, [2]Clemson Univ., Blackville, SC, [3]Mississippi State Univ., Stoneville, MS, [4]Mississippi State Univ., Mississippi State, MS

10:00 **1991** SmartStax and PowerCore corn insect resistance traits update. **Kevin Johnson** (kdjohnson@dow.com)[1], Bradley Hopkins[2], Laura Campbell[3], Dwain Rule[2], Miles Lepping[2], Nicholas Storer[2], Kent Davies[2] and Jill Zeller[2], [1]Dow AgroSciences, Danville, IL, [2]Dow AgroSciences, Indianapolis, IN, [3]Dow AgroSciences, Carbondale, IL

10:10 **1992** Implementing best practices to complement resistance management guidelines. **Clinton Pilcher** (clint.pilcher@pioneer.com), DuPont Pioneer, Johnston, IA

10:20 **1993** An ecological perspective on dose for insect resistance management. **Nicholas Friedenberg** (nick@ramas.com)[1], Jeannette Martinez[2] and Michael Caprio[3], [1]Applied Biomathematics, Setauket, NY, [2]U.S. Environmental Protection Agency, Washington, DC, [3]Mississippi State Univ., Mississippi State, MS

10:30 **1994** Establishment of baseline toxicology data for use in insecticide resistance management of Asian citrus psyllid (*Diaphorina citri*, Kuwayama) populations in California. **Frank J. Byrne** (frank.byrne@ucr.edu), Univ. of California, Riverside, CA

10:40 **1995** Management of insecticide-resistant diamondback moth in Georgia cole crops. **David Riley** (dgr@uga.edu), Alton N. Sparks, Jr. and Philip Torrance, Univ. of Georgia, Tifton, GA

10:50 **1996** Does a plant-eating insect's diet govern the evolution of insecticide resistance? Comparative phylogenetic tests of the pre-adaptation hypothesis. **Nate Hardy** (nbhardy@gmail.com)[1] and Daniel Peterson[2], [1]Auburn Univ., Auburn, AL, [2]Univ. of Massachusetts, Amherst, MA

10-min: SysEB, Systematics and Biodiversity of Coleoptera

Meeting Room 505 (Convention Center)

Moderators: James Liebherr[1] and Dave Clarke[2], [1]Cornell Univ., Ithaca, NY, [2]Univ. of Memphis, Memphis, TN

8:00 **1997** Studies in the defensive secretions of Panagaeitae (Coleoptera: Carabidae). **James M. Pflug** (pflugja@oregonstate.edu) and David Maddison, Oregon State Univ., Corvallis, OR

8:10 **1998** New New Caledonian *Mecyclothorax* (Coleoptera: Carabidae): Telltale tails tell all. **James Liebherr** (jkl5@cornell.edu), Cornell Univ., Ithaca, NY

8:20 **1999** Monophyly within the Plochionida group (Chaudoir, 1872) of lebiine carabids (Coleoptera: Lebiini: Agrina). **Beulah Garner** (b.garner@nhm.ac.uk), The Natural History Museum, London, United Kingdom

8:30 **2000** Exploring the utility of ultraconserved elements for phylogenetic inference of Coleoptera. **Stephen Baca** (s953b810@ku.edu), Alana Alexander, Grey Gustafson and Andrew Short, Univ. of Kansas, Lawrence, KS

8:40 **2001** Systematics and evolution of the whirligig beetle tribe Gyrinini (Coleoptera: Gyrinidae: Gyrininae). **Grey Gustafson** (gtgustafson@gmail.com) and Andrew Short, Univ. of Kansas, Lawrence, KS

8:50 **2002** Systematics of the North American Dasytinae (Coleoptera: Melyridae): A hairy mess. **Matthew Gimmel** (mgimmel@sbnature2.org)[1] and Adriean Mayor[2], [1]Santa Barbara Museum of Natural History, Santa Barbara, CA, [2]Univ. of Tennessee, Knoxville, TN

9:00 **2003** On the morphology of water scavenger beetles (Coleoptera: Hydrophilidae). **Jennifer C. Girón** (jcgiron@ku.edu) and Andrew Short, Univ. of Kansas, Lawrence, KS

9:10 **2004** The *Acmaeodera* (Coleoptera: Buprestidae) of Texas. **Jason Hansen** (jason.a.hansen@aphis.usda.gov), USDA - APHIS, Los Indios, TX

9:20 **2005** Biology and taxonomic history of *Triarius* and related genera (Coleoptera: Chrysomelidae). Shawn M. Clark and **Ethan Anderson** (ethanrus.anderson@gmail.com), Brigham Young Univ., Provo, UT

9:30 **2006** Total evidence phylogeny and biogeography of the tortoise beetle tribe Dorynotini (Coleoptera: Chrysomelidae: Cassidinae). **Marianna V. P. Simões** (marianna_simoes1@ku.edu), Univ. of Kansas, Lawrence, KS

9:40 **2007** Exotic tortoise beetles (Chrysomelidae: Cassidinae) intercepted at U.S. ports of entry. **Joel Perez-Mendoza** (joel.perez-mendoza@aphis.usda.gov), USDA - APHIS, Riverdale, MD

9:50 **Break**

10:00 **2008** Species identifiers vs. allometric scaling: Is variation in external traits used to distinguish *Acanthoselides* seed beetles (Coleoptera: Chrysomelidae: Bruchinae) informative of species status or just body size? **Geoffrey Morse** (gmorse@sandiego.edu) and Kinana McDaniel, Univ. of San Diego, San Diego, CA

10:10 **2009** Effect of ecological stress on the magnitude of inbreeding depression in four populations of seed beetle, *Callosobruchus maculatus*. **Amy Springer** (amy.springer@aggiemail.usu.edu), Frank Messina and Zachariah Gompert, Utah State Univ., Logan, UT

10:20 **2010** Phylogenomics of longhorned beetles (Cerambycidae): Does expanded taxon sampling improve phylogenetic resolution? **Seunggwan Shin** (sshin4@memphis.edu)[1], Asela Wijeratne[2], Stephanie Haddad[1], Hannah Nadel[3], Ann M. Ray[4] and Duane D. McKenna[1], [1]Univ. of Memphis, Memphis, TN, [2]Arkansas State Univ., Jonesboro, AR, [3]USDA - APHIS, Buzzards Bay, MA, [4] Xavier Univ., Cincinnati, OH

10:30 **2011** Morphological phylogeny and evolution of weevils (Curculionidae): New insights from the 1K Weevils Project. **Dave Clarke** (djclarke@memphis.edu)[1], Rolf Oberprieler[2], Adriana Marvaldi[3] and Duane D. McKenna[1], [1]Univ. of Memphis, Memphis, TN, [2]CSIRO, Canberra, Australia, [3]Univ. Nacional de La Plata, Buenos Aires, Argentina

10:40 **2012** The biogeography of a bark beetle community in a central Nebraska pine island. **Kevin Chase** (kchase@umn.edu)[1], Robert Venette[2], Mark Abrahamson[3], Angie Ambourn[3] and Brian Aukema[1], [1]Univ. of Minnesota, St. Paul, MN, [2]USDA - Forest Service, St. Paul, MN, [3]Minnesota Dept. of Agriculture, St. Paul, MN

10:50 **2013** Resolving the chaos of Cryphalini taxonomy. **Andrew Johnson** (ajj@ufl.edu)[1], Bjarte Jordal[2], Jiri Hulcr[1] and Duane D. McKenna[3], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Bergen, Bergen, Norway, [3]Univ. of Memphis, Memphis, TN

11:00 **2014** Ancient wanderlust leads to diversification of endemic Hawaiian *Xyleborus* species (Coleoptera: Curculionidae: Scolytinae). **Anthony I. Cognato** (cognato@msu.edu)[1], Bjarte Jordal[2] and Daniel Rubinoff[3], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Bergen, Bergen, Norway, [3]Univ. of Hawai'i, Honolulu, HI

11:10 **2015** Developing an identification tool for Southeast Asian xyleborine ambrosia beetles (Coleoptera: Curculionidae: Scolytinae). **Sarah M. Smith** (smith462@msu.edu)[1], Roger A. Beaver[2], Jiri Hulcr[3], Rachel Osborn[4], Sudhir Singh[5] and Anthony I. Cognato[1], [1]Michigan State Univ., East Lansing, MI, [2]Chiangmai, Thailand, [3]Univ. of Florida, Gainesville, FL, [4]Michigan State Univ., Okemos, MI, [5]Forest Research Institute, Dehradun, India

11:20 **2016** Overcoming mechanical adversity in extreme hindleg weapons. **Devin O'Brien** (devin.m.obrien@gmail.com) and Romain Boisseau, Univ. of Montana, Missoula, MT

10-min: SysEB, Systematics and Biology of Hemiptera and Their Endosymbionts

Meeting Room 603 (Convention Center)

Moderator: *Julie Urban, Pennsylvania State Univ., University Park, PA*

8:00 **2017** Variation in the structure of male genitalia of Asian genera of tribe Halyini, (Pentatomidae: Hemiptera). **Nasreen Memon** (nasreen_kousarbks@hotmail.com), Univ. of Sindh, Jamshoro, Pakistan

8:10 **2018** Comparative genomics of the secondary endosymbiont of the pea aphid *Hamiltonella defensa*. **Germain Chevignon** (gchevign@uga.edu), Jayce W. Brandt, Bret M. Boyd, Kerry M. Oliver and Michael Strand, Univ. of Georgia, Athens, GA

8:20 **2019** Generalizing Hemiptera response to host plant polymorphism using insect traits. **Elske Tielens** (elske.tielens@gmail.com) and Dan Gruner, Univ. of Maryland, College Park, MD

8:30 **2020** Changing fitness effects of a transformational bacterial endosymbiont on its invasive whitefly host. **Alison Bockoven** (abockoven@email.arizona.edu), Martha Hunter and Elizabeth Bondy, Univ. of Arizona, Tucson, AZ

8:40 **2021** Passing the torch: An obligate adelgid symbiont steps back from its role as the primary producer. **Gaelen Burke** (grburke@uga.edu)[1], Kathryn Weglarz[2], Nathan Havill[3] and Carol von Dohlen[2], [1]Univ. of Georgia, Athens, GA, [2]Utah State Univ., Logan, UT, [3]USDA - Forest Service, Hamden, CT

8:50 **2022** Biology and microbial partners of the Welwitschia bug, *Probergrothius angolensis*. **Adam Martinez** (adam.martinez@uni-mainz.de), Chantal Ebert and Martin Kaltenpoth, Johannes Gutenberg Univ., Mainz, Germany

9:00 **Break**

9:10 **2023** Phylogeny, classification, and patterns of speciation for Aspidiotini armored scale insects (Hemiptera: Diaspididae). **Scott Schneider** (scott.schneider@ars.usda.gov)[1], Akiko Okusu[2] and Benjamin Normark[2], [1]USDA - ARS, Beltsville, MD, [2]Univ. of Massachusetts, Amherst, MA

9:20 **2024** Symbiont turnover and replacement in the evolution of Delphacidae. **Julie Urban** (jmu2@psu.edu), Pennsylvania State Univ., University Park, PA

9:30 **2025** First steps towards disentangling *Rhopalosiphum* (Hemiptera: Aphididae), a small but difficult genus. **Michael Skvarla** (mskvarla36@gmail.com)[1], Gary L. Miller[2] and Matthew Kramer[2], [1]Pennsylvania State Univ., University Park, PA, [2]USDA - ARS, Beltsville, MD

9:40 **2026** The true bugs (Heteroptera) of Illinois: Past, present, and future. **Daniel Swanson** (drswanny@gmail.com), Illinois Natural History Survey, Champaign, IL; Univ. of Illinois, Champaign, IL

10-min: SysEB, Systematics, Biodiversity, & Conservation of Bees

Meeting Room 401 (Convention Center)

Moderator: Michael Orr, Utah State Univ., Logan, UT

8:00 **2027** Examining changes in the bee fauna of Caledon, central Ontario: A long-term analysis of community composition and structure. **Claire Rubens** (crubens@uoguelph.ca), Univ. of Guelph, Guelph, ON, Canada

8:10 **2028** Monitoring the conservation status of bumble bee populations across an elevation gradient in the Front Range of Colorado. Carol Kearns[1], Diana Oliveras[1] and **Claire Lay** (claire_lay@abtassoc.com)[2], [1]Univ. of Colorado, Boulder, CO, [2]Abt Associates, Boulder, CO

8:20 **2029** Phylogeographic structure of the agriculturally important bee species *Osmia lignaria* and *O. ribifloris*. **Michael Branstetter** (michael.branstetter@ars.usda.gov), USDA - ARS, Logan, UT

8:30 **2030** Bees at large: Identifying invasive bees in the United States. **Skyler Burrows** (skyler.burrows@gmail.com)[1], Lori R. Spears[1], Allan Smith-Pardo[2], Terry Griswold[3], Amanda Redford[4] and Ricardo Ramirez[1], [1]Utah State Univ., Logan, UT, [2]USDA - APHIS, San Francisco, CA, [3]USDA - ARS, Logan, UT, [4]USDA - APHIS, Fort Collins, CO

8:40 **2031** Farming for bees: Annual variation in pollinator populations across multiple agricultural landscapes. **Erika Tucker** (erika.tucker@unh.edu) and Sandra Rehan, Univ. of New Hampshire, Durham, NH

8:50 **Break**

9:00 **2032** Development of a sequencing pipeline for rapid identification of pollinator communities. **Rebecca B. Simmons** (rebecca.simmons@email.und.edu), Brian Darby and Mia Park, Univ. of North Dakota, Grand Forks, ND

9:10 **2033** Interest exceeds understanding in public support of bee conservation. **Joseph Wilson** (joeswilson@gmail.com)[1], Olivia Messinger Carril[2] and Matthew L. Forister[3], [1]Utah State Univ., Tooele, UT, [2]Santa Fe, NM, [3]Univ. of Nevada, Reno, NV

9:20 **2034** The bees (Hymenoptera: Apoidea) of Itasca State Park: Then and now. **Joel Gardner** (gard0228@umn.edu), Univ. of Minnesota, St. Paul, MN

9:30 **2035** North America's rich bee fauna: Where resides the wealth? **Terry Griswold** (terry.griswold@ars.usda.gov)[1], John S. Ascher[2], Doug Yanega[3], Michael Orr[4], Zach Portman[4] and Joseph Wilson[5], [1]USDA - ARS, Logan, UT, [2]National Univ. of Singapore, Singapore, Singapore, [3]Univ. of California, Riverside, CA, [4]Utah State Univ., Logan, UT, [5]Utah State Univ., Tooele, UT

9:40 **2036** Bee biogeography in the xeric southwestern United States. **Michael Orr** (michael.christopher.orr@gmail.com)[1], Terry Griswold[2] and James P. Pitts[1], [1]Utah State Univ., Logan, UT, [2]USDA - ARS, Logan, UT

9:50 **2037** Likely resident populations of a euglossine bee (*Eufriesea sp.*) in two national parks of west Texas, USA (Hymenoptera: Apidae). **Robinson Sudan** (robinson@newleaf-tx.org), New Leaf, Austin, TX

MUVE Section Symposium: The Challenge of Tick-borne Diseases

Meeting Room 404 (Convention Center)

Moderators and Organizers: Kirby Stafford and Goudarz Molaei, Connecticut Agricultural Experiment Station, New Haven, CT

9:00 **2038** Ecological studies of tick-borne pathogens in the Upper Midwest. Susan Paskewitz, Scott Larson and **Xia Lee** (xlee1@wisc.edu), Univ. of Wisconsin, Madison, WI

9:15 **2039** Tick-borne disease risk in southeastern Virginia: Surveillance and modeling. **Holly Gaff** (hgaff@odu.edu) and Wayne Hynes, Old Dominion Univ., Norfolk, VA

9:30 **2040** Four decades of ticking in Connecticut and the plague of Lyme and other tick-associated diseases. **Goudarz Molaei** (goudarz.molaei@ct.gov), John F. Anderson, Kirby Stafford III and Eliza Little, Connecticut Agricultural Experiment Station, New Haven, CT

9:45 **2041** An update on the USDA - ARS area-wide tick IPM project. **Andrew Li** (andrew.li@ars.usda.gov), USDA - ARS, Beltsville, MD

10:00 **2042** Evidence-based policy making: Environmental tick control to prevent human illness. **Alison F. Hinckley** (cue0@cdc.gov), Centers for Disease Control and Prevention, Fort Collins, CO

10:15 **2043** Habitat and winter survival of *Ixodes scapularis* and *Amblyomma americanum*. **Kirby Stafford III** (kirby.stafford@ct.gov)[1], Scott Williams[1], Goudarz Molaei[1], Charles Lubelczyk[2] and Margaret Welch[2], [1]Connecticut Agricultural Experiment Station, New Haven, CT, [2]Maine Medical Center Research Institute, Scarborough, ME

10:30 **2044** Controlling cattle ticks without acaricides: The challenge of anti-tick vaccination. **Glen Scoles** (scoles@vetmed.wsu.edu), USDA - ARS, Pullman, WA

10:45 **2045** Citizen science informs the prevalence, distribution, and risk of tick bite and tick-borne infection in the United States. **Nathan Nieto** (nathan.nieto@nau.edu)[1], Luke Martin[2], W. Tanner Porter[1], Thomas Lowrey[1], Julie Wachara[1] and Daniel Salkeld[2], [1]Northern Arizona Univ., Flagstaff, AZ, [2]Colorado State Univ., Fort Collins, CO

P-IE Section Symposium: New Tools and Tactics to Manage Insecticide Resistance

Meeting Room 709 (Convention Center)

Moderators and Organizers: Scott Ludwig[1], Graham P. Head[2], Caydee Savinelli[3], James Steffel[4] and Rebecca Willis[5], [1]Nichino America, Arp, TX, [2]Monsanto Company, St. Louis, MO, [3]Syngenta Plant Protection, Greensboro, NC, [4]LABServices, Hamburg, PA, [5]BASF Corporation, Research Triangle Park, NC

9:00 **Welcoming Remarks**

9:15 **2046** U.S. invasion by the old world bollworm: We know it's coming, but what should we do? **Gregory Sword** (gasword@tamu.edu)[1], Todd Gilligan[2], Omaththage Perera[3], Jason Wulff[1], Carrie Deans[1], Ashley Tessnow[1], Marianne P. Carey[4] and Amanda Hodges[5], [1]Texas A&M Univ., College Station, TX, [2]USDA - APHIS, Fort Collins, CO, [3]USDA - ARS, Stoneville, MS, [4]Case Western Reserve Univ., Cleveland, OH, [5]Univ. of Florida, Gainesville, FL

9:30 **2047** The importance of understanding *Bemisia tabaci* cryptic species identification (i.e. biotypes) and how this can impact IRM programs. **Cindy McKenzie** (cindy.mckenzie@ars.usda.gov)[1], Lance Osborne[2], Vivek Kumar[2], Ronald Oetting[3] and Cristi L. Palmer[4], [1]USDA - ARS, Fort Pierce, FL, [2]Univ. of Florida, Apopka, FL, [3]Univ. of Georgia, Griffin, GA, [4]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

9:45 **2048** Bed bugs: What went wrong and can we fix it. **Kenneth F. Haynes** (khaynes@uky.edu), Univ. of Kentucky, Lexington, KY

10:00 **2049** The use of genetically engineered insects for insect resistance management. **Simon Warner** (simon.warner@oxitec.com), Oxitec Ltd, Abingdon, United Kingdom

10:15 **2050** The implications of fall armyworm strains for insect resistance management. **Rodney N. Nagoshi** (rodney.nagoshi@ars.usda.gov), USDA - ARS, Gainesville, FL

10:30 **2051** The use of CRISPR/Cas9 in understanding and overcoming insecticide resistance. **David Heckel** (heckel@ice.mpg.de), Max Planck Institute for Chemical Ecology, Jena, Germany

10:45 **2052** RNAi for insect control and insect resistance management. **Blair Siegfried** (bsiegfried1@ufl.edu), Univ. of Florida, Gainesville, FL

11:00 **2053** Evolution of Bt protein mode of action for insect resistance management. **Victor Guzov** (victor.m.guzov@monsanto.com), Monsanto Company, Cambridge, MA

SysEB Section Symposium: Breaking into the Biobank: Promising Methods for Sequencing DNA from Museum Arthropod Specimens

Meeting Room 605 (Convention Center)

Moderators and Organizers: Michael Forthman[1] and Eric Gordon[2], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of California, Riverside, CA

9:00 **2054** Unlocking the genetic potential of the world's biological collections. **David Yeates** (david.yeates@csiro.au)[1], Andreas Zwick[1] and Alexander Mikheyev[2], [1]CSIRO, Acton, Australia, [2]Okinawa Institute of Science and Technology, Onna, Japan

9:15 **2055** Sequence capture of archival insect specimens using custom PCR-generated baits. **Alexander Knyshov** (aknys001@ucr.edu), Eric Gordon and Christiane Weirauch, Univ. of California, Riverside, CA

9:30 **2056** Utilizing ultraconserved elements in hemipteran museum specimens for phylogenetics. **Troy Kieran** (kierant@uga.edu)[1], Brant Faircloth[2], Eric Gordon[3], Rochelle Hoey-Chamberlain[3], Michael Forthman[4], Christiane Weirauch[3] and Travis Glenn[1], [1]Univ. of Georgia, Athens, GA, [2]Louisiana State Univ., Baton Rouge, LA, [3]Univ. of California, Riverside, CA, [4]Univ. of Florida, Gainesville, FL

9:45 **2057** Ancient DNA in the modern world: Approaches and methods. **Alisa Vershinina** (vershininaalissa@gmail.com), Univ. of California, Santa Cruz, CA

10:00 **2058** Optimizing success of sequencing historical specimens: How new approaches solve old problems in ground beetles. **John Sproul** (johnssproul@gmail.com) and David Maddison, Oregon State Univ., Corvallis, OR

10:15 **Break**

10:30 **2059** Cross-species DNA capture hybridization in museum specimens. **William Murphy** (wmurphy@cvm.tamu.edu), Texas A&M Univ., College Station, TX

10:45 **2060** Staying alive: Genetic confirmation that the Lord Howe stick insect is not extinct. **Alexander Mikheyev** (alexander.mikheyev@oist.jp)[1], Andreas Zwick[2], Michael Magrath[3], Miguel Grau Lopez[1], Qiu Lijun[1] and David Yeates[2], [1]Okinawa Institute of Science and Technology, Onna, Japan, [2]CSIRO, Acton, Australia, [3]Zoos Victoria, Parkville, Australia

11:00 **2061** Generation and analysis of phylogenomic ultraconserved elements from 100+ year-old bee specimens. **Seán Brady** (bradys@si.edu) and Bonnie Blaimer, Smithsonian Institution, Washington, DC

11:15 **2062** Arthropods meet proteomics: The selection of insect samples from museum collections using rapid and reliable protein screening techniques. **Samantha Presslee** (slp534@york.ac.uk)[1], Abigail Lowe[1], Anna Holden[2] and John Southon[3], [1]Univ. of York, York, United Kingdom, [2]American Museum of Natural History, New York, NY, [3]Univ. of California, Irvine, CA

11:30 **Panel Discussion**

MUVE Section Symposium: DoD-Funded Research to Transform Ideas into Products

Meeting Room 302/303 (Convention Center)

Moderator and Organizer: Gabriela Zollner, Armed Forces Pest Management Board, Silver Spring, MD

10:00 **2063** Presentation withdrawn

10:15 **2064** Productizing bloodsuckers' fatal attraction. Agenor Mafra and **Kim Spencer** (kim.spencer@iscatech.com), ISCA Technologies, Inc, Riverside, CA

10:30 **2065** From concept to shelf: Commercializing a novel insect-repellent device. **Laurie Widder** (lwidder@widderbros.com) and Gary Innocenti, Novel Textiles & Treatments, LLC, New York, NY

10:45 **2066** Optimizing transfluthrin products for the control of mosquitoes and sand flies. **Sheila Ogoma** (sheila.ogoma@usamru-k.org), Santos Yalwala, Chrispinus Makokha, James Mancuso and Thomas Gilbreath, U.S. Army Medical Research Directorate, Kisumu, Kenya

11:00 **2067** Simple nondestructive colorimetric permethrin test kit. **Michael Kavanaugh** (michael.d.kavanaugh2.mil@mail.mil), Navy Entomology Center of Excellence, Jacksonville, FL

11:15 **2068** Isolation and identification of potential biopesticidal compounds from the North American mosquito repelling folk remedy plant, *Matricaria discoidea*. **Charles Cantrell** (charles.cantrell@ars.usda.gov)[1], Abbas Ali[2] and A. Maxwell Jones[3], [1]USDA - ARS, Univ., MS, [2]Univ. of Mississippi, University, MS, [3]Univ. of Guelph, Guelph, ON, Canada

11:30 **2069** Vector control applied research: Challenges and strategies. **Kamlesh R. Chauhan** (kamal.chauhan@ars.usda.gov), USDA - ARS, Beltsville, MD

11:45 **2070** Phytochemical synergists for insecticides: Replacements for piperonyl butoxide. Edmund Norris[1], Joel R. Coats[1], Aaron Gross[2] and **Lyric Bartholomay** (lyric.bartholomay@wisc.edu)[1], [1]Iowa State Univ., Ames, IA, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

Wednesday, November 8, 2017 • AFTERNOON

Closing Plenary Session

Four Seasons Ballroom (Convention Center)

Moderators and Organizers: Susan J. Weller[1] and C. David Gammel[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Entomological Society of America, Annapolis, MD

12:15 **Grand Challenges Video**

12:30 **Introduction of Executive Committee**

12:35 **Service Recognition**

12:45 **2071** 2017 Presidential Closing Address. **Susan J. Weller** (susan.weller@unl.edu), Univ. of Nebraska, Lincoln, NE

1:00 **Passing of the Gavel**

1:05 **2072** 2018 Presidential Address. **Michael Parrella** (mpp@uidaho.edu), Univ. of Idaho, Moscow, ID

1:30 **Concluding Remarks**

Workshop: Making the Switch: A Beginner's Guide to R for Those Familiar with Other Packages

Meeting Room 705 (Convention Center)

Moderators and Organizers: Rebecca Schmidt-Jeffris[1] and Drew Tyre[2], [1]Clemson Univ., Charleston, SC, [2]Univ. of Nebraska, Lincoln, NE

1:30 **2073** Making the switch: A beginner's guide to R for those familiar with other packages. **Drew Tyre** (atyre2@unl.edu), Univ. of Nebraska, Lincoln, NE

Late-Breaking MUVE Section Symposium: Invasion and Subsequent Eradication of Screwworm in Florida (2016-2017)

Meeting Room 712 (Convention Center)

Moderator and Organizer: Steve Skoda, USDA - ARS, Kerrville, TX

1:30 **Introductory Remarks**

1:35 **2074** Sampling to determine the extent of the outbreak population. **John Welch** (john.b.welch@aphis.usda.gov), USDA - APHIS, College Station, TX

1:50 **2075** Establishing sterile insect releases: The USDA-ARS response. **Pamela Phillips** (pamela.phillips@ars.usda.gov), USDA - ARS, Kerrville, TX

2:05 **2076** USDA-APHIS-VS's organization of the response to the screwworm. **Cristopher Young** (cristopher.a.young@aphis.usda.gov), USDA - APHIS, Conyers, GA

2:20 **Break**

2:30 **2077** The State of Florida's response to the screwworm outbreak. Joe Fisch[1], Nelly Amador-Jehn[1] and **Trevor Smith** (trevor.smith@freshfromflorida.com)[2], [1]Florida Dept. of Agriculture and Consumer Services, Tallahassee, FL, [2]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

2:45 **2078** Contributions to the response by USDA-APHIS-IS. **Rebecca Bech** (rebecca.a.bech@aphis.usda.gov), USDA - APHIS, Raleigh, NC

3:00 **2079** Delivering sterile screwworms by the Panama – U.S. Commission for Eradication and Prevention of Screwworm (COPEG). **Gwen Keller** (gwen.p.keller@aphis.usda.gov), USDA - APHIS, Pacora, Panama

3:15 **Concluding Remarks**

MUVE Section Symposium: Vector Management Using Consumer Products

Meeting Room 710 (Convention Center)

Moderators and Organizers: Jennifer Gordon, Tom Mascari, Daniel Usry and Daniel Usry, SC Johnson & Son, Inc., Racine, WI

1:30 **Introductory Remarks**

1:35 **2080** Developing and delivering innovative vector control products: Exploring opportunities for commercial markets and consumer products. Nick Hamon, Tom McClean, David McGuire, David Malone and **Jason Richardson** (jason.richardson@ivcc.com), IVCC, Liverpool, United Kingdom

1:50 **2081** Are you bug body ready? - The use of repellents in disease control. **James Logan** (james.logan@lshtm.ac.uk), London School of Hygiene and Tropical Medicine, London, United Kingdom

2:05 **2082** Fix and forget: Malaria control technology applied to the US consumer pest control market. **Helen Pates Jamet** (hpj@vestergaard.com), Vestergaard, Washington, DC

2:20 **2083** Consumer products for public health vector control: Considerations for success. **Nicole L. Achee** (nachee@nd.edu), Univ. of Notre Dame, Notre Dame, IN

2:35 **2084** Interrupting arthropod vectors using spatial repellents. **Christopher Bibbs** (chrisfish89@ufl.edu)[1,2] and Rui-De Xue[1], [1]Anastasia Mosquito Control District of St. Johns County, St. Augustine, FL, [2]Univ. of Florida, Gainesville, FL

2:50 **Concluding Remarks**

3:00 **Discussion**

PBT Section Symposium: Insect Genome Data Management: Progress and Perspectives

Meeting Room 301 (Convention Center)

Moderators and Organizers: Amit Sethi[1] and Bindiya Sachdev[2], [1]DuPont Pioneer, Johnston, IA, [2]Kansas State Univ., Manhattan, KS

1:30 **Introductory Remarks**

1:35 **2085** The genome of the fall webworm, *Hyphantria cunea*. Ningning Wu[1], Sufang Zhang[2], Xiaowei Li[1], Yanghui Cao[1], Qun Liu[1], Huihui Liu[2], Xiao Hu[1], Qinghua Wang[2], Zhen Zhang[2], **Yong Ping Huang** (yphuang@sibs.ac.cn)[1] and Shuai Zhan[1], [1]Chinese Academy of Sciences, Shanghai, China, [2]Chinese Academy of Forestry, Beijing, China

1:50 **2086** Metagenome characterization in wild populations of vector mosquito *Aedes albopictus*, *Ae. aegypti*, *Anopheles gambiae*, and *An. sinensis*. **Jiannong Xu** (jxu@nmsu.edu)[1], Dong Pei[1], Aditi Kulkarni[1], Qing Xia[1], Jinjin Jiang[1], Zebib Abraha[1], Jesus Barba[1], Wanqin Yu[1], Rui-De Xue[2], Yajun Ma[3] and Mara Lawniczak[4], [1]New Mexico State Univ., Las Cruces, NM, [2]Anastasia Mosquito Control District of St. Johns County, St. Augustine, FL, [3]Second Military Medical Univ., Shanghai, China, [4]Sanger Institute, Cambridge, United Kingdom

2:05 **2087** Molecular basis of polyphagy and insecticide resistance in agriculture pests. **Kallare Arunkumar** (arun@cdfd.org.in), Centre for DNA Fingerprinting and Diagnostics, Hyderabad, India

2:20 **2088** Orthology utilities for driving insect science. **Robert Waterhouse** (robert.waterhouse@gmail.com), Univ. of Geneva, Geneva, Switzerland

2:35 **Break**

2:50 **2089** Resources for arthropod genome data management at the National Agricultural Library: The i5k Workspace@NAL and Ag Data Commons. **Monica F. Poelchau** (monica.poelchau@ars.usda.gov) and Christopher Childers, USDA - ARS, Beltsville, MD

3:05 **2090** Integrating insect genome data for a community resource. **Susan Brown** (sjbrown@ksu.edu)[1], Monica Munoz-Torres[2], Monica F. Poelchau[3] and Surya Saha[4], [1]Kansas State Univ., Manhattan, KS, [2]Lawrence Berkeley National Laboratory, Berkeley, CA, [3]USDA - ARS, Beltsville, MD, [4]Boyce Thompson Institute for Plant Research, Ithaca, NY

3:20 **Concluding Remarks**

P-IE Section Symposium: Inspiring a New Cadre of Vegetable Specialists By Sharing Expertise Related to Piercing-Sucking Insects of Economic Importance in Vegetable Production

Meeting Room 706 (Convention Center)

Moderators and Organizers: Silvia Rondon and Josephine Antwi, Oregon State Univ., Hermiston, OR

1:30 **Welcoming Remarks**

1:35 **2091** Current and future management of onion thrips-transmitted *Iris yellow spot virus* in onion. **Brian A. Nault** (ban6@cornell.edu)[1], Stuart Reitz[2] and Timothy Waters[3], [1]Cornell Univ., Geneva, NY, [2]Oregon State Univ., Ontario, OR, [3]Washington State Univ., Pasco, WA

1:50 **2092** Seasonal and spatial patterns of aster yellows phytoplasma infectivity and pathogen diversity in Wisconsin carrots. **Russell Groves** (groves@entomology.wisc.edu)[1], Justin Clements[1], Marjorie Garcia[1], Linda Crubaugh[1], Emily Duerr[1], Agnieska Zwolinska[2], Richard Immink[3], Stan Maree[4] and Saskia Hogenhout[5], [1]Univ. of Wisconsin, Madison, WI, [2]Institute of Plant Protection, Poznan, Poland, [3]Wageningen Univ., Wageningen, Netherlands, [4]John Innes Center, Norwich, United Kingdom, [5]The John Innes Centre, Norwich, United Kingdom

2:05 **2093** Current research on three major heteropteran pests attacking vegetables in the Mid-Atlantic U.S. **Thomas Kuhar** (tkuhar@vt.edu)[1], Donald Weber[2], Anna Wallingford[3], Anthony S. DiMeglio[1], James Wilson[1] and Hayley Bush[1], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]USDA - ARS, Beltsville, MD, [3]Cornell Univ., Geneva, NY

2:20 **Break**

2:30 **2094** Molecular diagnostics and phylogenetics of aster yellows phytoplasma (AYp) in leafhoppers. **Zsofia Szendrei** (szendrei@msu.edu), Katherine Demeuse, Ari Grode, Ellen Cole and Carolyn Malmstrom, Michigan State Univ., East Lansing, MI

2:45 **2095** Lygus bugs management on potatoes in western states. **Josephine Antwi** (josephine.antwi@oregonstate.edu) and Silvia Rondon, Oregon State Univ., Hermiston, OR

3:00 **2096** Whiteflies: Problems and solutions in vegetable crops. **Alvin Simmons** (alvin.simmons@ars.usda.gov), USDA - ARS, Charleston, SC

3:15 **2097** *Edessa meditabunda* (F.), a polyphagous pentatomid pest of vegetables in the Neotropics: Feeding behavior, sites, and damage. **Antônio Panizzi** (antonio.panizzi@embrapa.br) and Tiago Lucini, Embrapa National Wheat Research Center, Passo Fundo, Brazil

3:30 **Concluding Remarks**

P-IE Section Symposium: Leveraging Non-Traditional Uses of Microbial Control Agents for Broad Application in Crop Production and Protection

Meeting Room 704 (Convention Center)

Moderators and Organizers: Surendra Dara[1] and David Shapiro-Ilan[2], [1]Univ. of California Cooperative Extension, San Luis Obispo, CA, [2]USDA - ARS, Byron, GA

1:30 **2098** Out of the field and into global health: *Bacillus thuringiensis* crystal proteins as a cure for intestinal parasitic nematodes in humans. Yan Hu[1], Jason Noon[1], Ambily Abraham[1], Hanchen Li[1], Deysy Pinto Rodriguez[1], David Gazzola[1], Florentina Rus[1], Joseph Urban[2], Gary Ostroff[1] and **Raffi Aroian** (raffi.aroian@umassmed.edu)[1], [1]Univ. of Massachusetts, Worcester, MA, [2]USDA - ARS, Beltsville, MD

2:00 **2099** Entomopathogenic, endophytic, and mycorrhiza-like role of entomopathogenic fungi as holistic tools in agriculture. **Surendra Dara** (skdara@ucdavis.edu)[1], Sudha Dara[2], Sumanth Dara[2], Suchitra Dara[2] and Tim Anderson[3], [1]Univ. of California Cooperative Extension, San Luis Obispo, CA, [2]Global Agricultural Solutions, Bakersfield, CA, [3]Dow AgroSciences, Shafter, CA

2:15 **2100** Ecological effects of entomopathogens and other fungi as endophytes in cotton. Gregory Sword[1], **Michael V. Kolomiets** (kolomiets@tamu.edu)[1], Eli Borrego[1], Charles Suh[2] and Cody Gale[1], [1]Texas A&M Univ., College Station, TX, [2]USDA - ARS, College Station, TX

2:30 **2101** Foraging of entomopathogenic nematodes: Fifty shades of smell. **Ivan Hiltpold** (hiltpold@udel.edu), Univ. of Delaware, Newark, DE

2:45 **2102** The use of *Photorhabdus* and *Xenorhabdus* metabolites for suppression of phytopathogens. **David Shapiro-Ilan** (david.shapiro@ars.usda.gov)[1], Selcuk Hazir[2] and Clive Bock[1], [1]USDA - ARS, Byron, GA, [2]Adnan Menderes Univ., Aydin, Turkey

3:00 **2103** Ways to access bioactive natural products from entomopathogenic bacteria. **Helge Bode** (h.bode@bio.uni-frankfurt.de), Goethe-Univ., Frankfurt, Germany

3:15 **Discussion**

Member Symposium: Chemical Ecology in the New Era of Technology

Meeting Room 603 (Convention Center)

Moderators and Organizers: Loren Rivera Vega, Anjel Helms and Swayamjit Ray, Pennsylvania State Univ., University Park, PA

1:30 **2104** Investigating bombardier beetle defensive chemistry with an explosive mixture of transcriptomics, phylogenetics, and chemical ecology. **Tanya Renner** (trenner@mail.sdsu.edu)[1], Aman Gill[2], Reilly McManus[3], Athula Attygalle[4], Kipling Will[2] and Wendy Moore[3], [1]Pennsylvania State Univ., University Park, PA, [2]Univ. of California, Berkeley, CA, [3]Univ. of Arizona, Tucson, AZ, [4]Stevens Institute of Technology, Hoboken, NJ

1:45 **2105** From sex pheromones to nestmate recognition: Deciphering evolutionarily conserved signaling properties of cuticular hydrocarbons. **Jan Buellesbach** (jan.b@berkeley.edu)[1], Neil Tsutsui[1], Thomas Schmitt[2], Jürgen Gadau[3] and Oliver Niehuis[4], [1]Univ. of California, Berkeley, CA, [2]Univ. of Würzburg, Würzburg, Germany, [3]Arizona State Univ., Tempe, AZ, [4]Univ. of Freiburg, Hauptstr, Germany

2:00 **2106** What can computational modeling tell us about the diversity of odor-capture structures in the Pancrustacea? **Lindsay Waldrop** (lindsay.waldrop@nmt.edu)[1], Yanyan He[1] and Shilpa Khatri[2], [1]New Mexico Institute of Mining and Technology, Socorro, NM, [2]Univ. of California, Merced, CA

2:15 **2107** Insects and microbes drive VOC emission from decomposing carrion resources. **Jonathan A. Cammack** (jonathan.cammack@ag.tamu.edu)[1], Jennifer Pechal[2], Stephen Sweet[1], Tawni Crippen[3], Anthony Knap[1], M. Eric Benbow[2] and Jeffery K. Tomberlin[1], [1]Texas A&M Univ., College Station, TX, [2]Michigan State Univ., East Lansing, MI, [3]USDA - ARS, College Station, TX

2:30 **Break**

2:45 **2108** Herbivory, pollination and the diversification of floral scent in evening primroses (Onagraceae). **Tania Jogesh** (tjogesh@chicagobotanic.org)[1], Rick Overson[1], Geoffrey Broadhead[2], Robert Raguso[2] and Krissa Skogen[1], [1]Chicago Botanic Garden, Glencoe, IL, [2]Cornell Univ., Ithaca, NY

3:00 **2109** New approaches in ^{1}H-NMR network analysis in plant-herbivore interactions. **Lora Richards** (lorar@unr.edu), Celso Oliveira, Lee A. Dyer and Christopher Jeffrey, Univ. of Nevada, Reno, NV

3:15 **SP2110** Determining a human scent signature for mosquito attraction. **Genevieve Tauxe** (gtauxe1@jhu.edu) and Conor McMeniman, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD

Member Symposium: Demographic and Behavioral Responses of Insects to Disturbance

Meeting Room 707 (Convention Center)

Moderator and Organizer: Cheryl Schultz, Washington State Univ., Vancouver, WA

1:30 **Introductory Remarks**

1:35 **2111** Plant-pollinator interactions after fire: Emergent insights at the intersection of experiment and natural history. **James H. Cane** (jim.cane@ars.usda.gov), USDA - ARS, Logan, UT

1:50 **2112** Wanna get buzzed out on the range? Pyric herbivory increases pollinator diversity and creates bumble bee habitat. **Shelly Wiggam** (wiggie@ksu.edu)[1], Chyna Pei[2], George Zonerowich[1], Lee Cohnstaedt[3] and Brian McCornack[1], [1]Kansas State Univ., Manhattan, KS, [2]North Dakota State Univ., Fargo, ND, [3]USDA - ARS, Manhattan, KS

2:05 **2113** Demographic response of endangered *Strymon acis bartrami* to prescribed and wild fires in Everglades National Park. **Erica Henry** (ehenry@ncsu.edu) and Nick Haddad, North Carolina State Univ., Raleigh, NC

2:20 **2114** Demographic responses of an endangered butterfly and its threatened hostplant to grass-specific herbicides: Balancing ecological costs and benefits of invasive species management. **Cheryl Schultz** (schultzc@wsu.edu), Washington State Univ., Vancouver, WA

2:35 **2115** Individual and species-level effects of nutrition on behavior and life history. **Sarah Jaumann** (jauma002@umn.edu) and Emilie C. Snell-Rood, Univ. of Minnesota, St. Paul, MN

2:50 **2116** The central role of behavioral studies in understanding the impacts of roadways on the endangered Hine's emerald dragonfly, *Somatochlora hineana*. **Daniel Soluk** (daniel.soluk@usd.edu) and Amber Furness, Univ. of South Dakota, Vermillion, SD

3:05 **2117** Plastic responses to living in noise. Or, sex in the noisy city! **Robin Tinghitella** (robin.tinghitella@du.edu), Univ. of Denver, Denver, CO

3:20 **Panel Discussion**

Member Symposium: Innovative Sunflower Insect Pest Management

Meeting Room 701 (Convention Center)

Moderators and Organizers: Janet Knodel[1] and Travis Prochaska[2], [1]North Dakota State Univ., Fargo, ND, [2]North Dakota State Univ., Minot, ND

1:30 **2118** Potential for use of host plant resistance against primary insect pests of sunflower. **Jarrad Prasifka** (jarrad.prasifka@ars.usda.gov), USDA - ARS, Fargo, ND

2:00 **2119** Application timing of insecticides for effective control of sunflower moth, *Homoeosoma electellum* (Hulst), in Texas and Kansas. **Ed Bynum** (ebynum@ag.tamu.edu)[1], Calvin Trostle[2], Roy Parker[3], Daniella Sekula-Ortiz[4] and Ron Meyer[5], [1]Texas A&M Univ., Amarillo, TX, [2]Texas A&M Univ., Lubbock, TX, [3]Texas A&M Univ., Corpus Christi, TX, [4]Texas A&M Univ., Weslaco, TX, [5]Colorado State Univ., Burlington, CO

2:15 **2120** Biology and pheromone trapping of sunflower lepidopteran pests in North Dakota. **Travis Prochaska** (travis.prochaska@gmail.com)[1], Patrick Beauzay[2], Janet Knodel[2], Ryan Buetow[3], Greg Endres[4], Audrey Kalil[5] and Lesley Lubenow[6], [1]North Dakota State Univ., Minot, ND, [2]North Dakota State Univ., Fargo, ND, [3]North Dakota State Univ., Dickinson, ND, [4]North Dakota State Univ., Carrington, ND, [5]North Dakota State Univ., Williston, ND, [6]North Dakota State Univ., Langdon, ND

2:30 **2121** Impact of planting dates and insecticide control on seed maggot *Neotephritis finalis* (Loew) damage in cultivated sunflower. **Anitha Chirumamilla** (anitha.chirumamilla@ndsu.edu)[1], G. A. S. M. Ganehiarachchi[2], Janet Knodel[3], Patrick Beauzay[3] and Laurence D. Charlet[4], [1]North Dakota State Univ., Langdon, ND, [2]Univ. of Kelaniya, Kelaniya, Sri Lanka, [3]North Dakota State Univ., Fargo, ND, [4]USDA - ARS, Fargo, ND

2:45 **2122** Evaluating early season below ground pest management in sunflowers. **Adam Varenhorst** (adam.varenhorst@sdstate.edu)[1], Brady Hauswedell[1], J. P. Michaud[2] and Janet Knodel[3], [1]South Dakota State Univ., Brookings, SD, [2]Kansas State Univ., Hays, KS, [3]North Dakota State Univ., Fargo, ND

3:00 **2123** Sunflower, *Helianthus annuus* L., seed traits as affected by insect pollination and seed predation. **Gary Brewer** (gbrewer2@unl.edu) and Kentaro Miwa, Univ. of Nebraska, Lincoln, NE

3:15 **2124** Predators pay the price in neonicotinoid-treated sunflowers: Is toxic extra-floral nectar the culprit? **Michael Bredeson** (michael.bredeson@sdstate.edu)[1] and Jonathan Lundgren[2], [1]South Dakota State Univ., Brookings, SD, [2]Ecdysis Foundation, Estelline, SD

Member Symposium: Insect Eggs: Ecology, Morphology, and Applied Entomology

Meeting Room 708 (Convention Center)

Moderators and Organizers: Seth Donoughe and Sam Church, Harvard Univ., Cambridge, MA

1:30 **Welcoming Remarks**

1:35 **2125** Assembling a database of egg morphologies from 6,500+ insect species to test long-standing questions about the evolution of life history strategies. **Sam Church** (church@g.harvard.edu), Seth Donoughe and Bruno de Medeiros, Harvard Univ., Cambridge, MA

1:50 **2126** Uncovering the cellular dynamics of egg appendage diversity within Drosophilidae. **Miriam Osterfield** (miriam.osterfield@utsouthwestern.edu), Univ. of Texas Southwestern Medical Center, Dallas, TX

2:20 **2127** Egg morphology and chorionic ultrastructure of stored-product insect pests. **Sandipa Gautam** (sangautam@ucanr.edu)[1], George Opit[2] and Spencer Walse[3], [1]Kearney Agricultural Sciences Center, Parlier, CA, [2]Oklahoma State Univ., Stillwater, OK, [3]USDA - ARS, Parlier, CA

2:35 **Break**

2:45 **2128** Desiccation resistance in insect eggs: What we know from a springtail, a dragonfly, a beetle and three mosquito genera. **Gustavo Rezende** (grezende@uenf.br)[1], Luana Farnesi[2], Helena Vargas[1,3], Julie Souta[1], Lucas Xavier[1], Chris Jacobs[4], Ademir Martins[2], Dick Roelofs[3] and Denise Valle[2], [1]Univ. Estadual do Norte Fluminense, Campos dos Goytacazes, Brazil, [2]Fundação Oswaldo Cruz, Rio de Janeiro, Brazil, [3]Vrije Univ., Amsterdam, Netherlands, [4]Max Planck Institute for Chemical Ecology, Jena, Germany

3:15 **2129** Evolutionary ecology of insect egg coloration: An underrated but egg-citing topic! **Eric Guerra-Grenier** (ericguerragrenier@cmail.carleton.ca), Carleton Univ., Ottawa, ON, Canada

3:30 **2130** Using live-imaging, computational cell modeling, and a large-scale morphological dataset to predict embryological attributes of insect eggs that span eight orders of magnitude in size. **Seth Donoughe** (donoughe@fas.harvard.edu), Sam Church, Jordan Hoffmann, Bruno de Medeiros, Chris Rycroft and Cassandra Extavour, Harvard Univ., Cambridge, MA

3:45 **2131** Presentation withdrawn

3:45 **Concluding Remarks**

Member Symposium: Insect Microclimates in a Changing World

Meeting Room 302/303 (Convention Center)

Moderators and Organizers: Kennan Oyen and Michael E. Dillon, Univ. of Wyoming, Laramie, WY

1:30 **2132** A continuum of Arctic microclimates: From "warm" to "cold". **Todd Sformo** (tlsformo@alaska.edu), Univ. of Alaska, Fairbanks, AK

1:45 **2133** The evolution of plasticity in the city: Urban acorn ants can better tolerate rapid increases in environmental temperature. **Sarah Diamond** (sarah.diamond@case.edu), Case Western Reserve Univ., Cleveland, OH

2:00 **2134** Fine-scale microclimate variation across an urban landscape shapes both mosquito population dynamics and arbovirus transmission potential. **Michelle Evans** (mvevans@uga.edu)[1,2], Justine Shiau[1], Nicole Solano[3], John Drake[1,2] and Courtney Murdock[1,2], [1]Univ. of Georgia, Athens, GA, [2]Center for the Ecology of Infectious Diseases, Athens, GA, [3]Agnes Scott College, Decatur, GA

2:15 **Break**

2:30 **2135** Thermal ecology of insect herbivores: A biophysical view of the insect-plant interface. **Sylvain Pincebourde** (sylvain.pincebourde@univ-tours.fr), Univ. de Tours, Tours, France

2:45 **2136** Multi-scale approaches of crop microclimates in complex agro-ecological landscapes: Implications for insect pests. **Émile Faye** (emile.faye@cirad.fr)[1], Francois Rebaudo[2], Mario Herrera[3], Charli Carpio[4] and Olivier Dangles[2], [1]Centre International de Recherche en Agronomie pour le Développement, Montpellier, France, [2]Pontificia Univ. Catolica, Quito, Ecuador, [3]Instituto Nacional de Investigaciones Agropecuarias, Quito, Ecuador, [4]Escuela Superior Politécnica de Chimborazo, Riobamba, Ecuador

3:00 **SP2137** Weak links: Behavioral and physiological implications of thermal tolerance variation within social insect colonies. **Kaitlin Baudier** (kbaudier@asu.edu)[1] and Sean O'Donnell[2], [1]Arizona State Univ., Tempe, AZ, [2]Drexel Univ., Philadelphia, PA

3:10 **2219** Integrating thermal and hydric microclimates in the context of energetics and mass balance. **Mike Sears** (sears3@clemson.edu), Clemson Univ., Clemson, SC

3:25 **2220** Temperature and light in the brood cell of Megachile rotundata, the alfalfa leafcutting bee. **Kendra Greenlee** (kendra.greenlee@ndsu.edu), North Dakota State Univ., Fargo, ND

3:40 **2221** Microclimates in overwintering: Energy use and stress tolerance. **Katie Marshall** (kemarshall@ou.edu), Univ. of Oklahoma, Norman, OK

Member Symposium: International Collaboration in Entomology: Successes and Challenges

Meeting Room 709 (Convention Center)

Moderators and Organizers: Harit K. Bal[1,2], Ameya Gondhalekar[3], Swapna Priya Rajarapu[4], Nandi Nagaraj[5], Murugesan Rangasamy[5] and Garima Kakkar[6], [1]Association of Indian Entomologists in North America, East Lansing, MI, [2]Michigan State Univ., East Lansing, MI, [3]Univ. of Florida, Gainesville, FL, [4]The Ohio State Univ., Wooster, OH, [5]Dow AgroSciences, Indianapolis, IN, [6]Univ. of Florida, Fort Pierce, FL

1:30 **2138** Strengthening scientific collaborations through research internship programs. **Luis A. Cañas** (canas.4@osu.edu), The Ohio State Univ., Wooster, OH

1:45 **2139** South-north collaboration for developing sustainable IPM strategies for African smallholder farmers. **Zeyaur Khan** (zkhan@icipe.org), International Centre of Insect Physiology and Ecology, Nairobi, Kenya

2:00 **2140** Partnership in reducing postharvest storage losses in developing countries. **Dieudonne Baributsa** (dbaribut@purdue.edu), Purdue Univ., West Lafayette, IN

2:15 **2141** Integrated pest management in central Asia. **Karim Maredia** (kmaredia@msu.edu), Michigan State Univ., East Lansing, MI

2:30 **2142** Global collaboration in locust management and interdisciplinary research: Successes and challenges. **Arianne Cease** (acease@asu.edu), Arizona State Univ., Tempe, AZ

2:45 **2143** No boundaries- *Aedes* SIT by Forrest Innovations in Africa and South America. **Roy Borochov** (roy@forrestinnovations.com), Forrest Innovations USA, St. Louis, MO

3:00 **2144** Global product development: Navigating science and culture to achieve success. **Michael Shaw** (mcshaw@dow.com), Dow AgroSciences, Indianapolis, IN

3:15 **Discussion**

Member Symposium: The Challenges of Effective Vector Control at the Intersection of Science, Policy, and Communications

Meeting Room 402 (Convention Center)

Moderator and Organizer: Ben Beard, Centers for Disease Control and Prevention, Fort Collins, CO

1:30 **Welcoming Remarks**

1:35 **2145** Preventing *Aedes aegypti*-transmitted arboviruses. **Roberto Barrera** (amz9@cdc.gov), Centers for Disease Control and Prevention, San Juan, PR

2:05 **2146** Preventing Lyme disease in the Information Age: Current challenges and strategies for promoting evidence-based practices. **Neeta P. Connally** (connallyn@wcsu.edu), Western Connecticut State Univ., Danbury, CT

2:20 **2147** Prevention of Rocky Mountain spotted fever on Arizona tribal lands. **Naomi Drexler** (isj3@cdc.gov), Centers for Disease Control and Prevention, Atlanta, GA

2:35 **2148** Policy implications for vector control interventions: The past, present, and future challenges. **Susanna Visser** (sfv1@cdc.gov), Centers for Disease Control and Prevention, Fort Collins, CO

2:50 **2149** Communication pitfalls and best practices for preventing vector-borne diseases. **Sue Partridge** (snm3@cdc.gov), Centers for Disease Control and Prevention, Fort Collins, CO

3:05 **Discussion**

Organized Meeting: International Aphid Genomics Consortium

Meeting Room 601 (Convention Center)

Moderator and Organizer: Allison Hansen, Univ. of Illinois, Champaign, IL

1:30 **2150** An update of the Phylloxera (*Daktulosphaira vitifoliae*) genome project. **Denis Tagu** (denis.tagu@rennes.inra.fr)[1], François Delmotte[2], Fabrice Legeai[1] and Claude Rispe[3], [1]INRA, Le Rheu, France, [2]INRA, Bordeaux, France, [3]INRA, Nantes, France

1:45 **2151** Discovery and validation of plant-manipulating effector proteins in grape phylloxera. **Chaoyang Zhao** (cyang@ucr.edu) and Paul Nabity, Univ. of California, Riverside, CA

2:00 **2152** Reconstructing the metabolism and evolution of *Daktulosphaira vitifoliae* from genome sequences. **Ying Zhang** (yingzhang@uri.edu)[1], Patrice Baa-Puyoulet[2], Edward James[3], Keith Dufault-Thompson[1], Nicolas Parisot[2], Federica Calevro[2] and Alex C. C. Wilson[3], [1]Univ. of Rhode Island, Kingston, RI, [2]INRA, Lyon, France, [3]Univ. of Miami, Coral Gables, FL

2:15 **2153** Developmental toolkit genes in the grape phylloxera *Daktulosphaira vitifoliae* Fitch: The duplications and losses of developmental genes. **Hsiao-ling Lu** (hsiaoling.lu2008@gmail.com)[1], Yi-min Hsiao[2] and Yuan-Hsiou Chang[1], [1]MingDao Univ., ChangHua, Taiwan, [2]National Taiwan Univ., Taipei, Taiwan

2:30 **Break/Discussion**

2:45 **2154** Chefs and sous-chefs in the adelgid kitchen: Differential division of labor in the ancient symbionts of sap-sucking insects (Sternorrhyncha: Adelgidae). **Gaelen Burke** (grburke@uga.edu)[1], Kathryn Weglarz[2], Nathan Havill[3] and Carol von Dohlen[2], [1]Univ. of Georgia, Athens, GA, [2]Utah State Univ., Logan, UT, [3]USDA - Forest Service, Hamden, CT

3:00 **2155** Electroshock CRISPR therapy in the pea aphid, *Acyrthosiphon pisum*. **Allison Hansen** (akh@illinois.edu) and Brendan Jamison, Univ. of Illinois, Champaign, IL

3:15 **2156** Aphid genomes in a phylogenetic context. **Colin Favret** (colinfavret@aphidnet.org), Univ. de Montréal, Montréal, QC, Canada

Organized Meeting: Lessons Learned from the March for Science

Meeting Room 605 (Convention Center)

Moderators and Organizers: Lisa Junker, Chris Stelzig, C. David Gammel and Joe Rominiecki, Entomological Society of America, Annapolis, MD

1:30 **2163** Effective advocacy following the March for Science. **Erin Cadwalader** (erin@lewis-burke.com), Lewis-Burke Associates, Washington, DC

1:45 **2157** Organizing a national March for Science. **Teon Brooks** (teon@marchforscience.com), March for Science, San Francisco, CA; Stanford Univ., Palo Alto, CA

2:15 **2158** The importance of decentralized leadership before, during, and after the March for Science. **Robert K. D. Peterson** (bpeterson@montana.edu), Montana State Univ., Bozeman, MT

2:30 **2159** Speaking out for insect and human diversity at the March for Science. **Jessica Ware** (jessicaleeware@gmail.com), Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

2:45 **2160** Marching for Science on some islands in the Pacific. **Helen Spafford** (helen.spafford@hawaii.edu), Univ. of Hawai'i, Honolulu, HI

3:00 **2161** An ESA Science Policy Fellow at the March for Science. **Marianne Alleyne** (vanlaarh@life.illinois.edu), Univ. of Illinois, Champaign, IL

3:15 **2162** Communicating science through the media. **M. Fran Keller** (mfkeller@ucdavis.edu), Folsom Lake College, Folsom, CA; Bohart Museum of Entomology, Davis, CA

10-min: P-IE, Chemical Ecology

Meeting Room 711 (Convention Center)

Moderators: Abdul Hakeem[1] and Kerry Mauck[2], [1]Texas A&M Univ., Lubbock, TX, [2]Univ. of California, Riverside, CA

1:30 **2164** Differential expression of chemosensory genes in spotted wing drosophila antennae. **Seung-Joon Ahn** (ahns@oregonstate.edu)[1,2] and Man-Yeon Choi[1], [1]USDA - ARS, Corvallis, OR, [2]Oregon State Univ., Corvallis, OR

1:40 **2165** Investigating host and mate-finding cues of the carrot weevil, *Listronotus oregonensis*. **Emily Justus** (justus.67@osu.edu) and Elizabeth Long, The Ohio State Univ., Wooster, OH

1:50 **2166** Smelling out the competition: Testing for pheromone autodetection in female swede midge (*Contarinia nasturtii*; Diptera: Cecidomyiidae). **Elisabeth Hodgdon** (ehodgdon@uvm.edu)[1], Rebecca Hallett[2] and Yolanda Chen[1], [1]Univ. of Vermont, Burlington, VT, [2]Univ. of Guelph, Guelph, ON, Canada

2:00 **2167** Real-time display of pheromone trap monitoring for wheat stem sawfly and orange wheat blossom midge. **David K. Weaver** (weaver@montana.edu), Montana State Univ., Bozeman, MT

2:10 **2168** Evaluating seed treatments and foliar insecticides against western flower thrips on cotton in Texas. **Abdul Hakeem** (ahakeem@vols.utk.edu)[1], Megha Parajulee[1], Suhas Vyavhare[1], Muhammad Ismail[2] and Robert Bowling[3], [1]Texas A&M Univ., Lubbock, TX, [2]Univ. of Sargodha, Sargodha, Pakistan, [3]Texas A&M Univ., Corpus Christi, TX

2:20 **2169** SPME sampling studies on *Rhynchophorus ferrugineus*. **Paraj Shukla** (parajshukla@gmail.com), M. M. Abdel-Azim, Ahmed Badjah-Hadj-Ahmed and Saleh A. Aldosari, King Saud Univ., Riyadh, Saudi Arabia

2:30 **2170** Semiochemical attractants for the beech leaf-mining weevil, *Orchestes fagi* (L.) (Curculionidae: Curculioninae: Rhamphini). **Peter Silk** (psilk@nrcan.gc.ca), Natural Resources Canada, Fredericton, NB, Canada

2:40 **2171** Repelling *Contarinia nasturtii* (Diptera: Cecidomyiidae), a specialist pest of brassica crops, using non-host essential oils. **Chase Stratton** (castratt@uvm.edu)[1], Cesar Rodriguez-Saona[2], Anthony M. Shelton[3] and Yolanda Chen[1], [1]Univ. of Vermont, Burlington, VT, [2]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [3]Cornell Univ., Geneva, NY

2:50 **Break**

3:00 **2172** Identification of attractive blend for spotted wing drosophila, *Drosophila suzukii* (Matsumura), from apple juice. **Aijun Zhang** (aijun.zhang@ars.usda.gov) and Yan Feng, USDA - ARS, Beltsville, MD

3:10 **2173** Response of three Neotropical mirid predators to herbivore-induced plant volatiles: Multiple herbivory vs. single herbivory. **Diego Silva** (diegobs182@yahoo.com.br)[1,2], Vanda Bueno[3], Maria Peñaflor[3], Joop van Lenteren[4], Joop van Loon[4] and José Mauricio Bento[1], [1]Univ. de São Paulo, Piracicaba, Brazil, [2]Rutgers, The State Univ. of New Jersey, Chatsworth, NJ, [3]Univ. Federal de Lavras, Lavras, Brazil, [4]Wageningen Univ., Wageningen, Netherlands

3:20 **2174** Development of a push-pull system to manipulate *Diorhabda carinulata* (Desbrochers) herbivory to enhance classical biological control of weeds. **Alexander Gaffke** (alexander.gaffke@msu.montana.edu)[1], David K. Weaver[1] and Sharlene Sing[2], [1]Montana State Univ., Bozeman, MT, [2]USDA - Forest Service, Bozeman, MT

3:30 **2175** Transmission-conducive effects of a plant virus on host chemistry and vector behavior depend on symbiosis with a beneficial root microbe. **Kerry Mauck** (kerry.mauck@ucr.edu)[1], Milica Nenadic[2], Luca Grandi[3], Mark Mescher[2] and Consuelo De Moraes[2], [1]Univ. of California, Riverside, CA, [2]ETH Zürich, Zürich, Switzerland, [3]Univ. de Neuchâtel, Neuchâtel, Switzerland

3:40 **2176** Evaluation of food-based attractants for spotted wing drosophila, *Drosophila suzukii*. **Juan Huang** (huangju@msu.edu), Larry Gut and Matt Grieshop, Michigan State Univ., East Lansing, MI

3:50 **2177** To study the analysed biochemical *characters* of diffrent okra (*Abelmoschus esculentus* (L.)) leaves and its relationship with the jassid (*Amrasca biguttula biguttula* (Ishida)) population. **Muhammad Ali** (ali.klasra@gmail.com) and Muhammad Ashfaq, Univ. of the Punjab, Lahore, Pakistan

4:00 **2178** Preventive and curative measures to combat early cotton insect pests. **Hayder Elbashir** (abdelgaderh@yahoo.com), Agricultural Research Corporation, Wad Madani, Sudan

10-min: P-IE, Ecology, General

Meeting Room 702 (Convention Center)

Moderators: J. P. Michaud[1], Nicole F. Quinn[2] and Kayla A. Mollet[3], [1]Kansas State Univ., Hays, KS, [2]Virigina Polytechnic Institute and State Univ., Winchester, VA, [3]Univ. of Nebraska, Lincoln, NE

1:30 **2179** Variations in the host preferences of *Phyllocnistis citrella* Stainton (Lepidoptera: Gracillariidae) based on morphological characteristics and trace elements of different citrus cultivars. **Muhammad Afzal** (chafzal64@yahoo.com), Muhammad Arshad, Muhammad Irfan Ullah, Abu Bakar Raza, Asad Abdullah and Muhammad Saqib, Univ. of Sargodha, Sargodha, Pakistan

1:40 **2180** Impact of citrus leafminer feeding on selected physiological parameters of citrus cultivars. **Muhammad Irfan Ullah** (mirfanullah@uos.edu.pk), Muhammad Arshad, Muhammad Afzal, Muhammad Saqib, Yasir Iftikhar and Abdul Khaliq, Univ. of Sargodha, Sargodha, Pakistan

1:50 **2181** Does polyandry enable the sharing of paternal effects among progeny of different fathers? A test with *Harmonia axyridis*. **J. P. Michaud** (jpmi@ksu.edu)[1], Ahmed Abdelwahab[2] and Vinícius Canassa[3], [1]Kansas State Univ., Hays, KS, [2]Mansoura Univ., Mansoura, Egypt, [3]Univ. Estadual Paulista, Botucatu, Brazil

2:00 **2182** Life cycle of *Zonocerus variegatus* (Orthoptera: Pyrgomorphidae) in the part of Cameroon south of the 6th parallel. **Sevilor Kekeunou** (skekeunou@gmail.com), Univ. of Yaounde I, Yaounde, Cameroon

2:10 **2183** Root herbivory alters soil microbial function and belowground carbon cycling. **Kyle Wickings** (kgw37@cornell.edu) and Huijie Gan, Cornell Univ., Geneva, NY

2:20 **2184** Spatial distribution of tree mortality caused by *Dendroctonus ponderosae*: Implications for restoration. **Jose Negron** (jnegron@fs.fed.us), USDA - Forest Service, Fort Collins, CO

2:30 **2185** Subterranean termite interactions with Ophiostomatoid (bluestain) fungi: Implications for wood decomposition. **Natalie Clay** (nclay@latech.edu)[1], Juliet Tang[2], Courtney Siegert[3], Nathan Little[4] and John Riggins[3], [1]Louisiana Tech Univ., Ruston, LA, [2]USDA - Forest Service, Starkville, MS, [3]Mississippi State Univ., Mississippi State, MS, [4]USDA - ARS, Stoneville, MS

2:40 **2186** Maternal effects on a biennial population of Mormon crickets: Role of photoperiod on egg development. **Robert B. Srygley** (robert.srygley@ars.usda.gov), USDA - ARS, Sidney, MT

2:50 **2187** Potentials of ProLure as attractant for mass trapping of insect pests of mango (*Mangifera indica* L.). **Anna Malgwi** (annamalgwi@yahoo.co.uk)[1], Clement Oaya[2] and Eunice Okoroafor[3], [1]Federal Univ. of Technology, Yola, Nigeria, [2]Adamawa State College of Agriculture, Ganye, Nigeria, [3]Federal Univ. of Agriculture, Makurdi, Nigeria

3:00 **2188** Novel and ancestral host plants and their effects on the endangered butterfly *Euphydryas editha* ssp. *taylori* (Nymphalidae). **Nathan Haan** (nhaan@uw.edu)[1], Jonathan Bakker[1] and M. Deane Bowers[2], [1]Univ. of Washington, Seattle, WA, [2]Univ. of Colorado, Boulder, CO

3:10 **2189** Dominant ground foraging ants impact ant-plant protection mutualisms in peach orchards. **Kate Mathis** (kmathis@email.arizona.edu), Univ. of Arizona, Tucson, AZ

3:20 **Break**

3:30 **2190** Niche modeling of monarch butterfly roadkill mortality from Texas to Mexico. **James Tracy** (jamesltracy@tamu.edu)[1], Tuula Kantola[1], Robert Coulson[1] and Mike Quinn[2], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., Austin, TX

3:40 **2191** Seasonal phenology of *Drosophila suzukii* (Diptera: Drosophilidae) in Wisconsin: Temperature and humidity effect. **Alina Avanesyan** (alina.avanesyan@gmail.com)[1], Christelle Guédot[2], Katie Hietala-Henschell[3] and Benjamin Jaffe[2], [1]Grand View Univ., Des Moines, IA, [2]Univ. of Wisconsin, Madison, WI, [3]The Xerces Society for Invertebrate Conservation, Portland, OR

3:50 **2192** Defense priming interacts with insecticide to influence growth and clonal reproduction in a field population of goldenrod *Solidago altissima*. **Eric Yip** (ecy7@cornell.edu)[1], John Tooker[1], Mark Mescher[2] and Consuelo De Moraes[2], [1]Pennsylvania State Univ., University Park, PA, [2]ETH Zürich, Zürich, Switzerland

4:00 **2193** Do insect assemblages track plant community restoration after invasive species removal? **Natalie West** (natalie.west@ars.usda.gov), David Branson and Erin Espeland, USDA - ARS, Sidney, MT

4:10 **2194** Impact of planting habitat for native pollinators on irrigation pivot corners in Nebraska. **Kayla A. Mollet** (kayla.mollet@huskers.unl.edu)[1], Judy Wu-Smart[1] and Julie Peterson[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, North Platte, NE

4:20 **2195** Habitat filtering and dispersal interact with precipitation to determine patch abundance of erebid caterpillars. **Patrick Grof-Tisza** (pgroftisza@ucdavis.edu), Richard Karban and Marcel Holyoak, Univ. of California, Davis, CA

4:30 **2196** Experimental evidence for direct and indirect antagonism between ants and aphid natural enemies. **Marina Kaiser** (marina.jankovic@bio.bg.ac.rs)[1], Matthew Kaiser[2], Andjeljko Petrovic[1], Zeljko Tomanovic[1] and Vesna Gagic[3], [1]Univ. of Belgrade, Belgrade, Serbia, [2]Iowa State Univ., Ames, IA, [3]CSIRO, Brisbane, Australia

4:40 **2197** Enhanced immunity and survival on an introduced host plant. **Angela Smilanich** (asmilanich@unr.edu)[1], Carmen Mo[1], Shahil Pema[1], Justine Dale[1] and M. Deane Bowers[2], [1]Univ. of Nevada, Reno, NV, [2]Univ. of Colorado, Boulder, CO

4:50 **2198** Immune function and growth performance of *Manduca sexta* fed diets of varying protein and carbohydrate content. **Jerome Wilson** (keatonwilson@email.arizona.edu), Laura Ruiz and Goggy Davidowitz, Univ. of Arizona, Tucson, AZ

5:00 **2199** Incidence and severity of insect and mite pests on avocado (cv. Hass) in Antioquia (Colombia, South America). **John Diaz-Montano** (jdiazm@corpoica.org.co), Claudia M. Holguin and Ovidio Montoya, Colombian Corporation for Agricultural Research, Rionegro, Colombia

5:10 **2200** On- and off-season habitat evaluation for *Drosophila suzukii* (Diptera: Drosophilidae). **Harit K. Bal** (bal@msu.edu)[1], Clarence Green[2], Christelle Guédot[3], Lindsy Iglesias[4], Oscar Liburd[4], Ashfaq Sial[2] and Matt Grieshop[1], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Georgia, Athens, GA, [3]Univ. of Wisconsin, Madison, WI, [4]Univ. of Florida, Gainesville, FL

5:20 **2201** Monarch butterfly (*Danaus plexippus*) milkweed host distribution and risk of monarch larval habitat loss in Texas. **Tuula Kantola** (tuulak@tamu.edu)[1], James Tracy[1], Robert Coulson[1] and Mike Quinn[2], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., Austin, TX

10-min: P-IE, IPM, Horticultural and Specialty Crops 2

Meeting Room 607 (Convention Center)

Moderators: Justin Renkema[1] and Juang-Horng Chong[2], [1]Univ. of Florida, Wimauma, FL, [2]Clemson Univ., Clemson, SC

1:30 **2202** Innovating VegNet: The use of mapping and metrics to enhance a 20-year-old IPM program. **Jessica Green** (jessica.green@oregonstate.edu)[1], Erin Martin[1], Dan McGrath[2] and Ed Peachey[1], [1]Oregon State Univ., Corvallis, OR, [2]Oregon State Univ., Albany, OR

1:40 **2203** Efficacy of plastic mulches in managing melon thrips, *Thrips palmi* in vegetable crops in southern Florida agroecosystems. **Mohammad Razzak** (rafi321@ufl.edu)[1], Dakshina Seal[1], Philip A. Stansly[2], Oscar Liburd[3] and Bruce Schaffer[1], [1]Univ. of Florida, Homestead, FL, [2]Univ. of Florida, Immokalee, FL, [3]Univ. of Florida, Gainesville, FL

1:50 **2204** Insecticide rotations for thrips (Thysanoptera: Thripidae) management in Florida strawberry. **Justin Renkema** (justin.renkema@ufl.edu)[1], Shashan Devkota[1], Babu Panthi[1], Oscar Liburd[2] and Joe Funderburk[3], [1]Univ. of Florida, Wimauma, FL, [2]Univ. of Florida, Gainesville, FL, [3]Univ. of Florida, Quincy, FL

2:00 **2205** Evaluation of some indigenous plant extract for the management of onion thrips, *Thrips tabaci* (Thysanoptera: Thripidae). **Shahbaz Ahmad** (shahbaz.iags@pu.edu.pk), Univ. of the Punjab, Lahore, Pakistan

2:10 **2206** Management of flower thrips in Georgia blueberries. **Brian Little** (balittle@uga.edu), Craig Roubos and Ashfaq Sial, Univ. of Georgia, Athens, GA

2:20 **2207** Ventigra™ insecticide for control of piercing and sucking insects in ornamentals and vegetable transplants. **Renee Keese** (renee.keese@basf.com), Tommy Wofford, Teresia Nyoike, Joe Stout, Catherine Holmes and Daniel O'Byrne, BASF Corporation, Research Triangle Park, NC

2:30 **2208** Inscalis™ insecticide for control of piercing-sucking pests in vegetable crops. Teresia Nyoike, Joe Stout, Steve Broscious, John Descary, Catherine Holmes, **Rebecca Willis** (rebecca.willis@basf.com), Tommy Wofford and Daniel O'Byrne, BASF Corporation, Research Triangle Park, NC

2:40 **Break**

2:50 **2209** Influence of interval between post-harvest lettuce residue management and subsequent seeding of broccoli on cabbage maggot (Diptera: Anthomyiidae) infestation on broccoli. **Shimat V. Joseph** (shimatbug@gmail.com)[1] and Larry Godfrey[2], [1]Univ. of California, Salinas, CA, [2]Univ. of California, Davis, CA

3:00 **2210** Ecology and management of bagrada bug (*Bagrada hilaris*) in the Salinas Valley. **Ian Grettenberger** (imgrettenberger@ucdavis.edu)[1] and Shimat Joseph[2], [1]Univ. of California, Davis, CA, [2]Univ. of California Cooperative Extension, Salinas, CA

3:10 **2211** Insectary strips and tillage influence cucumber beetle and predator densities in organic cucumber production. **Gladis Zinati** (gladis.zinati@rodaleinstitute.org)[1], Andrew H. Smith[1], Kristine Nichols[1], Joseph Ingerson-Mahar[2] and Tara Caton[1], [1]Rodale Institute, Kutztown, PA, [2]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

3:20 **2212** The influence of insectary strips on striped cucumber beetle parasitism and bacterial wilt prevalence: Refining molecular techniques for rapid detection. **Andrew H. Smith** (andrew.smith@rodaleinstitute.org), Gladis Zinati, Tara Caton and Kristine Nichols, Rodale Institute, Kutztown, PA

3:30 **2213** Detecting spider mite-induced stress in California strawberry using innovative remote sensing technology. **Elvira de Lange** (esdelange@ucdavis.edu)[1], Robert Starnes[1], Surendra Dara[2] and Christian Nansen[1], [1]Univ. of California, Davis, CA, [2]Univ. of California Cooperative Extension, San Luis Obispo, CA

3:40 **Break**

3:50 **2214** Arthropod biodiversity and natural pest suppression in vineyards under innovative management. **Theresa Pennington** (mrstheresapennington@gmail.com)[1], Christoph Hoffmann[2] and Martin Entling[1], [1]Univ. of Koblenz, Landau, Germany, [2]Julius Kühn-Institut, Siebeldingen, Germany

4:00 **2215** Develop a chemical management program for bermudagrass mite on golf courses. **Juang-Horng Chong** (juanghc@clemson.edu), Clemson Univ., Clemson, SC

4:10 **2216** Manipulating turfgrass diversity as an urban landscape IPM strategy. **Adam Dale** (agdale@ufl.edu), Univ. of Florida, Gainesville, FL

4:20 **2217** Bioactivity of systemic fungicides and plant growth regulators on black cutworm (*Agrotis ipsilon*) development and survival in turf. **R. Chris Williamson** (rcwilliamson@wisc.edu), Weston Ohl, Megan Kruse and Audrey Simard, Univ. of Wisconsin, Madison, WI

4:30 **2218** Tracking annual bluegrass weevil (*Listronotus maculicollis*) canopy activity reveals opportunities for controlling adults with oils and surfactants. **Benjamin McGraw** (bam53@psu.edu)[1], Benjamin Czyzewski[1], Steven Alm[2] and Albrecht M. Koppenhöfer[3], [1]Pennsylvania State Univ., University Park, PA, [2]Univ. of Rhode Island, Kingston, RI, [3]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

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Glossary of Terms and Abbreviations

Program Symposia:	ESA's top-tier symposia. These are broad in scope, represent multiple ESA Sections and reflect the meeting theme, ignite. inspire. innovate.
Section Symposia:	These symposia are overarching in theme and serve the interest of one of ESA's Sections.
Member Symposia:	A wide range of topics and subject matter are covered by this category; some of which are very narrowly focused.
Organized Meeting:	Specialty groups which hold their business meeting, student competitions, and other activities in conjunction with the ESA Annual Meeting are represented in this category.
10-min:	Ten-Minute (oral) Papers
3-min:	Three-minute (oral) Lightning Bug Talks
MUVE:	Medical, Urban, and Veterinary Entomology. One of the ESA Sections.
PBT:	Physiology, Biochemistry, and Toxicology. One of the ESA Sections.
P-IE:	Plant-Insect Ecosystems. One of the ESA Sections.
SysEB:	Systematics, Evolution, and Biodiversity. One of the ESA Sections.

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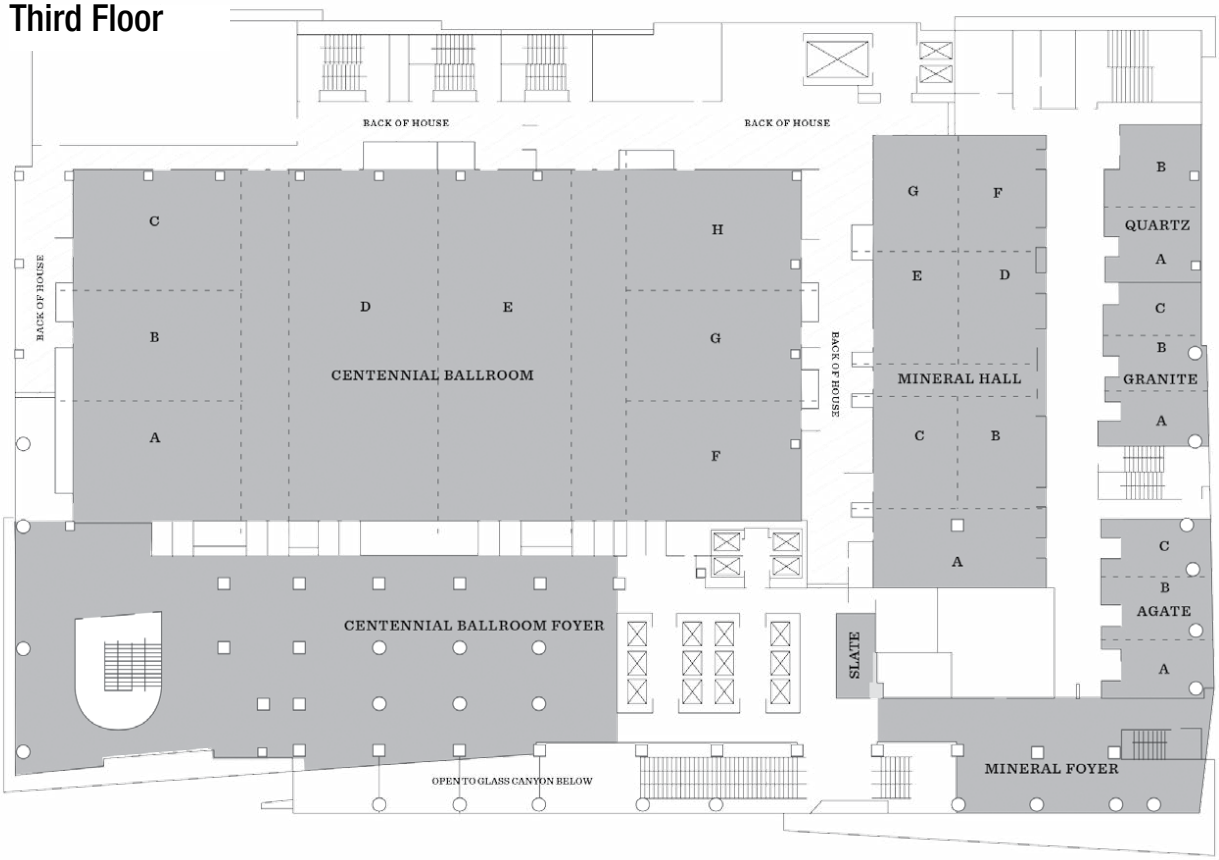

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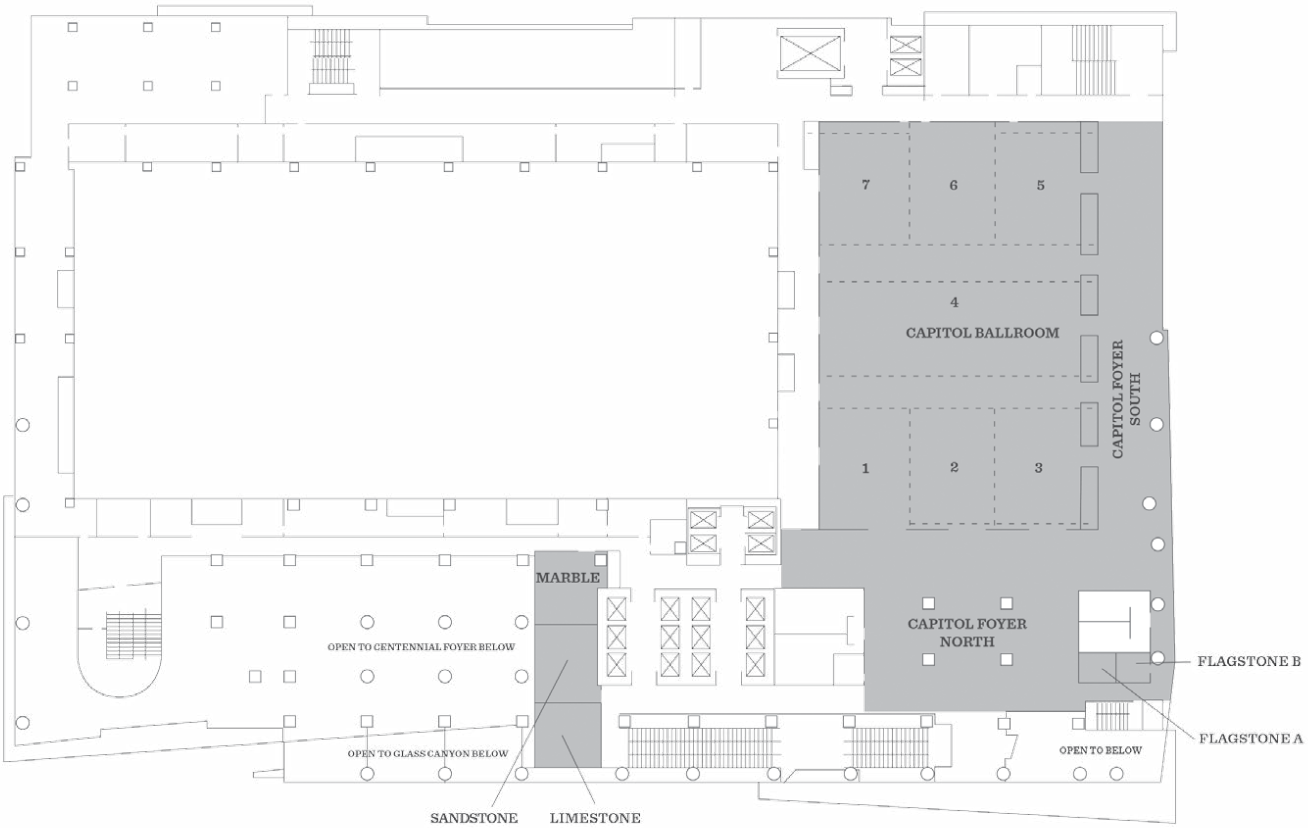

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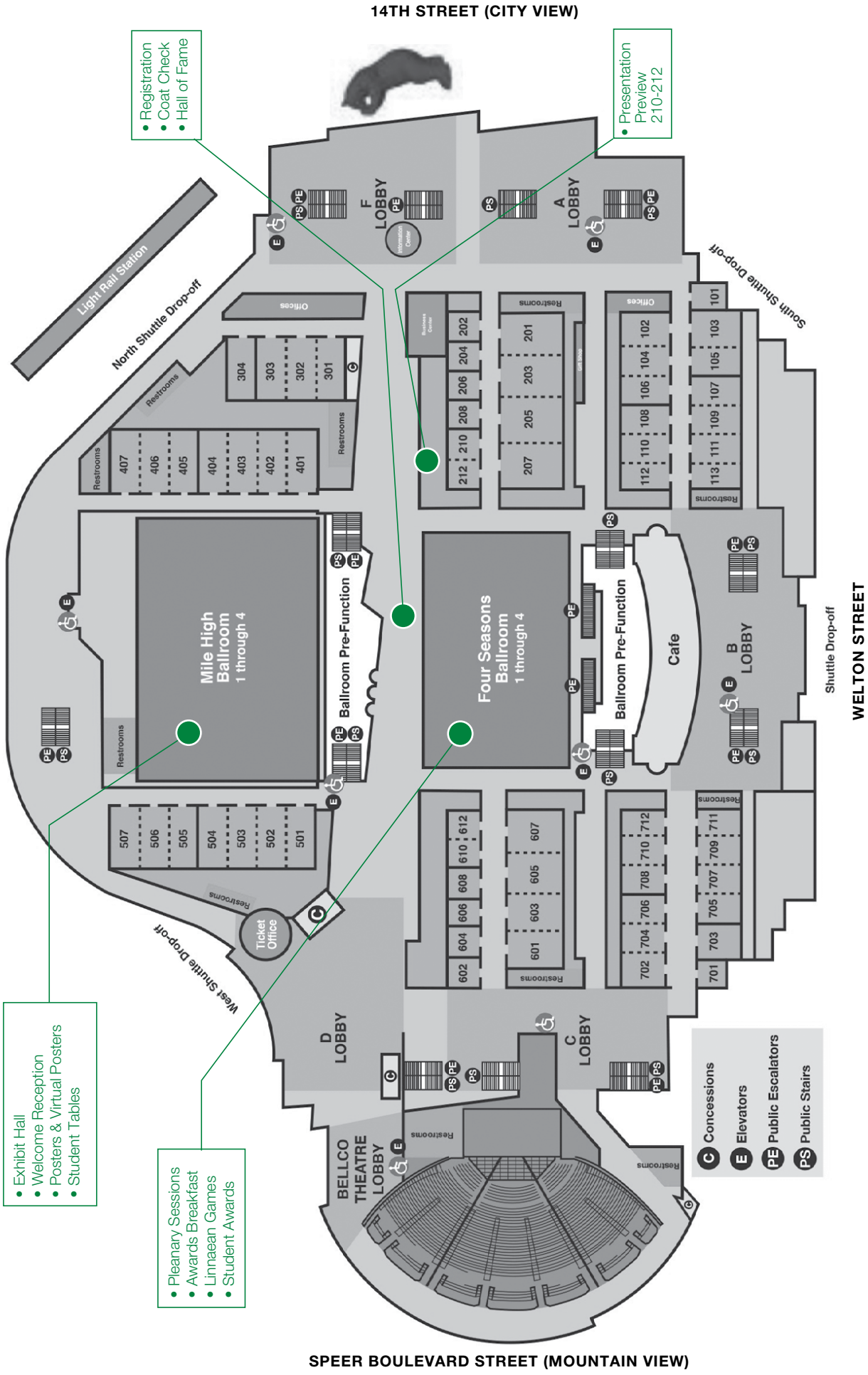

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The Entomological Society of America (ESA) is a non-partisan scientific organization. We represent a broad spectrum of opinions united under one principle: the promotion and advancement of scientific inquiry, discovery, and communication. The issues below are those on which we are most actively engaged. To support our efforts, we join coalitions of scientific societies to further our mission; employ policy specialists to assist in our decision-making; provide accurate scientific input to lawmakers, agency leaders, and other community stakeholders; and develop and support programming to educate scientists about the importance of scientific advocacy. This list of science policy priorities is based on member input and is active as of August 1, 2017. The priorities are overseen by the ESA Science Policy Committee and managed by ESA staff and our collaborators.

ESA Science Policy Fellows Clare Risttschof and Jennifer Gordon on Capitol Hill in May 2017

Priorities

Active

ISSUES

Highest levels of investing ESA resources

- **Scientific integrity**
- **Invasive insect species**
- **Pollinator health**
- **Public health (Vector-borne diseases)**
- **Climate change**
- **Science communication**

POSSIBLE ACTIONS

- Meetings with policymakers
- Hosting/co-hosting Capitol Hill briefings
- Writing position statements or white papers
- Engaging with federal agencies or related NGOs
- Authoring letters of support
- Social media advocacy
- Issuing press releases on policy-relevant publications
- Presentations at ESA meetings

Engaged

ISSUES

Modest level of investing ESA resources

- **Insecticide resistance management**
- **Integrated pest management**
- **Public outreach and education**
- **Loss of biodiversity**
- **Genetically-modified disease vectors**
- **Entomological collections**

POSSIBLE ACTIONS

- Participating in briefings hosted by other groups
- Signing on to letters of support from other groups
- Meetings with policymakers
- Writing position statements or white papers
- Engaging with federal agencies or related NGOs

Watching

ISSUES

Lowest level of investing ESA resources

- **Agricultural genetically-modified organisms**
- **Sustainable agriculture**
- **Professional education and training**
- **Food safety**
- **Urban pest management**

POSSIBLE ACTIONS

- These issues align with ESA priorities, but may not merit immediate attention. Engagement will be limited to opportunities that are low-cost and high-impact.

Submit your comments at **www.entsoc.org/science-policy-comments**

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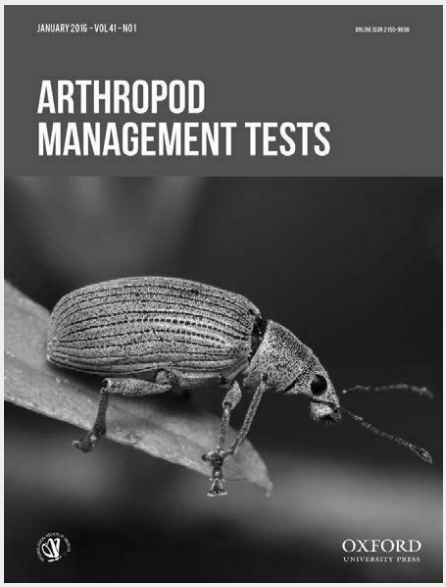

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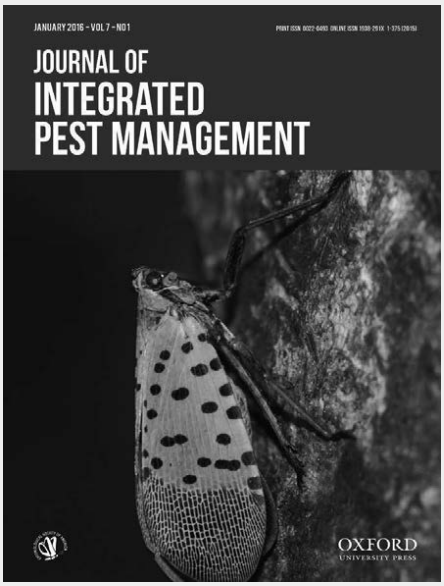

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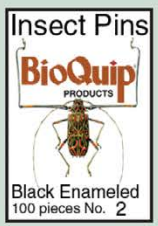


Foam Spreading Boards

Pin Holder

Digital Caliper

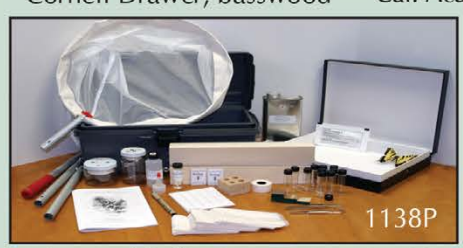
Cornell Drawer, basswood

Cal. Academy Drawer, poplar

USNM Drawer, basswood

Mosquito Dipper

Mosquito Resting Trap



Advanced Collecting & Mounting Kit

Insect Mounting Kit

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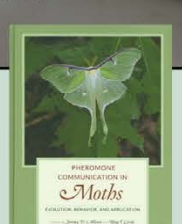
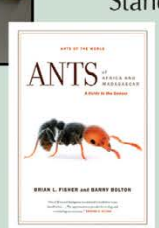
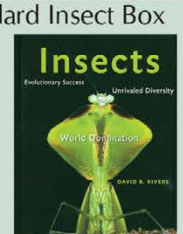
Standard Insect Box







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